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Henry Power on the Circulation of the Blood

F. J. COLE

MANY years ago Dr. Charles Singer drew my attention to the existence in the British Museum of the manuscript which follows. At that time it was not so necessary as it is now to marshal contemporary evidence in support of Harvey's claim to have discovered the circulation of the blood. The vital observation that lies at the root of this discovery, and in fact actually precipitated it, was the demonstration of one-way motion in the blood vessels—centrifugal in the arteries and centripetal in the veins. If this acid test is applied to the various and often perverse attempts to rob Harvey of the discovery, it is found that they all break down with the sole exception of Harvey himself. From this we must conclude that Harvey was the first to establish by experiment, and without exceptions, the doctrine of one-way motion in the blood system *as a whole.* Now Power follows Harvey, especially in devising experiments to confirm this point. He has also carefully studied the works of Harvey, whose influence is very obvious in this manuscript. There is some evidence in the references to the works of Glisson and Guiffart that the manuscript is antedated, but one may assume that it was written during the lifetime of Harvey.

Henry Power was born in 1623 and died in 1668, and could thus have been personally acquainted with Harvey. He was the son of an old friend of Sir Thomas Browne, with whom over many years he conducted a correspondence on scientific and philosophical matters, becoming in fact a "disciple" of that eminent master.[1] He published only one book, and his work is completely ignored by most classical historians of the history of science and medicine, but is briefly mentioned by Haller (ten lines), Portal (four lines), and Sprengel (six lines). Even Erik Waller's comprehensive library lacks a copy. He graduated M.A. at Cambridge in 1648 and M.D. in 1655. For a few years he practised medicine in Halifax, but finally settled in "New-Hall near Elland" in Yorkshire, where he died. He was elected into the Royal Society on 26 February 1662, and re-elected on 1 July 1663, but he was not one of the company which, on 5 December 1660, resolved to found a Society for "promoting experimentall learning." He was, however, one of

[1] Cf. T. Cowles, Dr. Henry Powers, disciple of Sir Thomas Browne. *Isis,* 1934, 20, 344-66.

Sir Humphry Rolleston. The reception of Harvey's doctrine of the circulation of the blood in England as exhibited in the writings of two contemporaries. In: *Essays on the history of medicine presented to Karl Sudhoff.* London and Zurich, 1924, pp. 251-254.

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the original elected Fellows of the Royal Society when it was formally instituted.

Power is particularly famous for his microscopical observations, in which he used four microscopes of the best manufacture available at the time. His work may be regarded as a modest anticipation of Hooke's *Micrographia* of 1665, which he mentions as a forthcoming publication by Wren and Hooke and expresses admiration for their figures drawn to the life and magnified. His own treatise was the first general essay on microscopy to be published in England, and he regrets its lack of figures. Power had an even more modest predecessor in Pierre Borel, whose century of microscopical researches, printed in 1656, is the rarest of all such works. Power had no doubts as to who discovered the circulation of the blood, which he attributes to the "incomparable invention of our Reverend and worthy Dr. Harvey."[2] He, however, agrees with Harvey's error that the heart of *Amphibia* and *Reptilia* has only one auricle, but he demonstrates experimentally that the ventricular septum of the four-chambered heart is not perforated, as assumed by the "Ancients" and in his own time by Riolan. The heart, he holds, has "an innate pulsificall virtue of its own," and he confirms Harvey's belief that venous blood can enter the heart, but that valves inhibit any of it leaving the heart to be driven to the periphery of the body.

One of Power's most important experiments was his injection of the portal vein with water tinged with milk. He found that the medium passed through the liver into the postcaval vein, and thence into the right heart, through the lungs, finally reaching the left heart and aorta. Such an experiment, he wrongly concludes, would not wash all the blood out of the liver if arterial and venous capillaries were not separated by an intervening spongy substance. Power therefore emphatically refuses to believe that there is an unbroken connection between artery and vein by means of microscopic capillaries. He repeats Harvey's experiments of compressing the vessels and observing the reaction above and below the point of compression, by which "you may distinctly see the Blouds circulation" in frogs, fishes, and snakes. It should be noted that in his printed work Power makes no use of, nor does he even mention, the material described in the manuscript dated some twelve years previously.

Power's poem on the microscope has been transcribed and printed with annotations by Cowles.[3] It is a rhyming meditation of 84 lines extolling the microscope and the importance of the discoveries thus made possible, which themselves are expounded in Power's printed book of a few years

[2] At the heading of folio 35 recto of the 1652 manuscript, Power added the following words: "Circulatio Sanguinis Harveiana Inventa ab Authore An.Dom. 1614." If this date is not an error for 1616, which latter is Harvey's own date for the announcement of the discovery, 1614 can hardly be accepted without adequate confirmation.

[3] Cowles, T. Dr. Henry Power's poem on the microscope. *Isis*, 1934, *21*, 71-80. Sloane Manuscript 1380, art. 16, dated 1661, in the British Museum.

later. Power's dates suggest a meticulous and leisurely observer. There are six in the *Experimental Philosophy* ranging from 1653 to 1664, and the book may have been issued in 1663. He was one of the first to associate the use of abusive language with Billingsgate, as when he scornfully compares philosophical squabbling with a "Heat 'twixt two Oyster-wives in Billingsgate."

Apart from Power's single published work there exist in the British Museum a number of unpublished manuscripts arranged in groups, some of which are dated 1653, 1659, and 1662.

I have added explanations of the numerous obsolete terms used by Power, but the solutions of the few I have been unable to trace are conjectural.

The trustees of the British Museum have kindly given their consent to the publication of the manuscript.

SLOANE MS. 1343

CIRCULATIO SANGUINIS

CAP. I.

Inventio Harveiana

Henry Power 1652

Certainly that great Lesson of Thales whose genealogy the Poet draws down from Heaven, was not only intended as a Precept of morality, to looke into our inward selves, and that nobler part of our Composition The Soule, but deliver'd also as a Lecture of Anatomy, to excite our search and enquiryes into the Fabrick and Contrivance of our outward man also viz. the Body. Wee are but unprofitable schollars, and learne but halfe our Lesson, if wee pry but into the Nature and operations of the one if wee doe not also by Autopsy and Inspection search and ransack the organised parts and artificial contrivance of the other. Methinkes it is a grosse and unpardonable piece of Ignorance, that wee should be Tennants for so long a lease of yeares to these Houses of flesh and yet in all this interim not so much as once view the Private Roomes, closetts, mechanicall fabrick, and Incomparable contrivance of this Carnall, Escuriall, or Noble Building of the Body, wherein everything is so admirably composed, all the parts so agreeable and apposite to the Constitutio and aeconomicall artifice of the whole, that well might Galen proffer the Philosopher (that quarrell'd at the Architecture) 100 yeares, to alter or change the situation, figure or Composition, of any one part of the Humane fabrick to a better and

more correspondent symmetry to the whole, and yet at last extort this Confession from him, that it were impossible to have cast him in a more Curious mold or to have raised so admirable an edifice out of so crude and Contemptible materialls.

Laudable indeed were the Anatomicall Attempts of the Ancients, and especially those of Galen, that first essay'd to take in pieces so Curious a fabrick. But alas Antiquity durst never un-ravell the Contexture of any Living-Animal, nor make a Privy search into the Roomes and camerellos[1] thereof untill the tennant had first flitt and Quitt his Mansion. Hence were their Anatomicall discovery's so imperfect and defective, and their Acquaintance with nature but slight and superficiall, and not at the Heart, whose reciprocall motion was as obscure and miraculous to them, as that great one of the Sea[2] was to their Coetaneous Philosophers. [They durst not storme the workes till the soule had dis-garrison'd.] Therefore hath the modern Industry of our later Physicians with exceeding successe adventured upon Nobler designes, and by Living dissections (comitting as it were a petty fellony against Nature), have attempted to break and open the House to behold hir at worke in hir presence chamber, and by ocular Inspection to learne the abstrusity of hir operations. Hence hath Anatomy in this last Century arriv'd to that height and perfection that shee only in the whole encyclopeody or Circle of Sciences seemes to sitt in the Zenith, all the rest as yet but aspiring towards their Meridian. Now amongst those Great Professers that have brought hir up to this Eminency, our Reverend and Worthy Dr. Harvey may justly challenge the precedency for that Incomparable Invention of his, the Circulation of the Blood.

There has not one Day pass'd, since that worthy production of his was first deliver'd into the world, but it hath mett with men of sevral humours and constitutions, some with very smart and active Discourse maintaining and avouching it, others with as much vehemency and passion busily refuting it, a third sort in these paper-skirmishes standing as Neutrals and in the middle way of a Semi-Circulation Composing the Differences. But amongst all the Rabble of his Antagonists, wee see not one that attempts to fight him at his own weapon, that is by sensible and Anatomicall evictions to Confute that, which hee has by Sense and Autopsy so vigorously Confirm'd. And therefore wee cannot but looke upon

1 A little chamber.
2 ? Aristotle. Stageira is a seaport.

such Scepticall and Tyrrhonian[3] Authors as Disciples to Anaxagoras that in defiance to the Noblest of his senses would needs maintaine the Snow was black and shall only Confute them as the walking Philosopher did the Stoick, that peremptoryly asserted there was no Such thing in the world as motion. Certainly these men may with the Same hopes attempt to dis-compose and subvert the theoremes of Euclide and shall as Soone persuade us that there is more than one Centre in a Circumference, or than 2 right Angles in every Triangle, as Startle our beliefs in the Anatomicall Demonstration of the Circulation.

And thus much by way of preface, now wee shall demonstrate this mysterious Doctrine by laying down some Anatomicall experiments gathred from Living dissection from which (as Mathematicians doe from their Postulata or Principles of Confess'd verity) wee shall spin out the thread and line of our Discourse.

CAP. 2.

Of the Heart and its Auricles.

Exp[eriment] 1

[a.] The chest in Living and perfect Animals being open'd, and the Heart un-Capsulated, 'tis easy to observe a successive, or Reciprocall motion and Quiescency which Anatomist's call the contraction and Dilatation of the Heart: which is more cleerly observable in frigid Animals, which have not by farr so quick and smart Reciprocations as in froggs, Snakes, vipers, toads and little fishes, etc. and likewise in all languid and Dying Animals, for then the Periods of it's motion are easyly discernable, and the Perisystole,[4] or interjected[5] Quiency is of a longer continuance.

[b.] In all the whole Ladder and scale of Creatures the Heart is not dis-coverable, for in muscles, Cates[']," oysters, escalops, and all shell-fish, no distinct pulsing particle is demonstrable, which may carry the least analogy to the Heart in Animals. Nor indeed is this maine organ discoverable in any of those Puny Creatures, wee tearme Zoophytes or Plantanimall's.

[3] Speculative.

[4] Interval between systole and diastole.

[5] Interpolated.

[6] A generalized culinary term, but the context suggests that the animal is the Cockle. All the bivalves mentioned have a well developed pulsating heart, although Harvey himself did not find a "heart" in Oysters and Mussels.

Exp.

[c.] In all kind of Snails whichever, wheather white, black, grey, or house snayles and in such like exanguious[7] and frigid Animals, which seeme but just to have escap'd the Plantall Nature of the Zoophyte's, in such I say a pulsing vesicle is discoverable, most manifestly in snayles just under that orifice on the right side which opens and shutts at hir pleasure, and which wee doubt not but wee shall demonstrate to supply the office of lungs in that creature:

[d.] In a louse and which is eminently observable in [illegible] semi- Animals the motion of this auricle is only observable in summer time and not in winter, so that by turnes they under goe the sensitive and vegetative Nature [illegible]. In a louse but especially in those greater and whiter sort, which wee call leagure-lice[8] you may easyly discover a pulsing particle, especially by the helpe of a magnifying glasse with great delight behold it's contraction and dilatation through the tralucency and diaphanity of hir Body.

Exp.

[e.] In Bees, Humble-bees, waspes, hornetts, winged flyes, and such Insects as Consist of Annulous and sheath'd bodyes, the Heart lyes at the top of that part which wee call the Tayle,[9] just below that tender filament,[10] which links the two extreames of the Animal togeather, and therefor if you take the insect alive, and dissect hir atwhart[11] the taile, within one or two rings of the top of it, you may cleerely dis-cover a white pulsing vesicle, or filmy Capsula, as it were an Auricle without an heart, which by it's iterated and repeated motions shows clearely that it does execute the same office in them, that the Heart does in other Animals.

Exp.

[f] In Shrimps, Cravicles,[12] Lobsters, Crabbs, and all such croustaceous Animals or Marine Insects (as I may so fittly call them), the Heart is discoverable, and especially in that little petty Shrimpe, which is usually taken in the Thames at London, in which (being cast into the water), because of the pellucidity of the

7 An Aristotelian term meaning animals without red blood.

8 Camp iice.

9 His "tayle" is the modern abdomen.

10 This must be the dorsal blood vessel of which the elongated heart is a part in insects.

11 Athwart.

12 ? Crayfish.

Body, you may perfectly see the motion and palpitation of it's heart, as through an amber or chrystall cased watch the Automaticall Motion of the Nutts and Wheeles are discoverable.[13]

Exp.

[g] Now in other Animals of a more solid and Compact substance, which require a more strong impulsive organ (then that tender vesicle) to propell the blood or Alimentitious humour into every part of their Body, a compleate heart with one Auricle is discoverable, as in most fishes, Snakes, vipers, adders, Lizards, Toads, froggs and the like.

Exp.

[h] Lastly in the most Calid and perfect Animals of all wherein Nature seemes to terminate and perfect the oeconomy of the Body, shee has superadded and annex'd the right ventricle and its auricle as to Birds, Beasts, I meane Quadrupeds, some fishes as whales,[14] dolphins and man.

Exp[*eriment* 2.]

The Heart, and it's Auricles are just contrary in their motion of Systole and Diastoly. The Constriction of the Auricles alwayes precedes that of the Heart, so that whilst the Auricles are in their systole, the Heart[15] is in it's diastole and so transpositively.

Exp[*eriment* 3.]

If you pearce either the right or left Auricle you shall evidently see the Blood at every Constriction to be push'd out at the wound.

Exp[*eriment* 4.]

Againe the Auricles in their systole i.e. whilst they are in their pulse and constriction are of a more white languishing colour especially towards their skirts, and extremityes then they are in their diastole because in their constriction, they eject that blood [illegible] which they received in their dilatation and wherewith they were tinctr'd in their dilatation, for ejection is the finall Cause of all Constriction.

13 This is an extract from Harvey, the "shrimpe" being probably *Daphnia*.

14 That a whale was not a true fish had already been established, but not accepted generally.

15 Note that the term "heart" was restricted to the ventricle at this early period.

Exp[eriment 5.]

The Auricles in their dilatation or interim of quiescence are farre more lax, placcid, and enervous, than they are in their constriction.

Exp[eriment 6.]

If you cutt of the right ventricle as neere its Auricle as you can, you shall see what Quantity of blood the Auricle ejects into the Heart at every Constriction. The like experiment may be made with the left ventricle and it's Auricle.

Exp.

Upon the dissection of the thorax, and collapsion of the Lungs (which immediately follow upon the opening of that Region) and so consequently the losse of Respiration, 'tis observable that the left auricle will first faint and grow languid in its palpitations, and after a while both it and the left ventricle will wholy cease their pulsation, the Auricle being of a whitish languid colour, and devoyd of all blood whatsoever.

Exp[eriment 7.]

Just at the very point and extremity of Death the left Auricle first ceases it's motion, then it's ventricle, and last of all the right Auricle which gives the utmost and finall resistance to Death. And what is observ'd solely of the Auricles, is exactly agreeable to the ventricles of the Heart also, for

Exp[eriment] 8.

If either ventricle of the Heart be pearc'd with a lancett, you shall see it squirt out blood at the orifice of the wound at every systole or contraction of the ventricles.

Exp[eriment] 9.

If you Cutt of the Core of the Heart, and so gently erect it upon it's basis, you shall see a good Quantity of blood will be ejaculated and that with much violence at every pulse.

Exp[eriment] 10.

Moreover in fishes, froggs, toads, Snakes, Serpents, and such frigid Animals,[16] this Truth will appear without the mangling, or

[16] It should be remembered that Power believed that all the types mentioned here had but a single auricle and ventricle.

Quartering of their ♥s for they being of a more spongy, flaccid Substance, doe receive a purple dye and tincture from the blood contain'd, so that at every Diastole, when it is impregnated with blood push'd out of the Auricle into it, it will be of a very faire purple and ruddy colour, so that the blood will be palpable by transparent through it, which being ejected in each systole the Heart will be of a wan and pale colour, and thus in these Animals you may see it with aboundance of delight, to shift colours by turn's, according to the Rythmns and tenor of the Systole and Diastole of their Heart.

Exp[eriment] 11.

If immediately upon Dissection of the thorax you make an Incision into the Heart, and thrust in your finger, you shall feele the blood to be of a farre greater heat and calescence than the Heart itselfe, the blood in the right ventricle to be Hotter then the ventricular substance that includes it, but that in the left ventricle to be of so great a fervency, as that you can not with out some little torment endure the scalding heat thereof.

Exp[eriment] 12.

Dissect a living dogge and immediately after the Heart is uncapsulated cutt of the left ventricle, so that the septum cordis or Partition-wall of the Heart, may be clearely visible, then observe if the right ventricle at every pulse squeese any blood through the septum, to be received by the left ventricle, according to the conceits and conjecturall whimseys of the Ancients, which you shall find to be absolutely false.

Besides, the Partition wall or medias tinum of the heart, you shall find to be in all Animalls of a very fleshy, fibrous, and compact substance (Columbus found it once to be all Cartilaginus) and absolutely devoyd of those faraminulous Cavitys and blind perforations which the Ancients as blindly conceited, and Riolan against all Inspection still obstinately maintains.

[*Experiment*] *13.*

The Heart if it be expectorated and layd upon a table, separated by the dissecting knife, from all it's vessells and ligaments whatsoever will for a long time retaine a manifest and vigorous pulsation, from an innate and pulsificall virtue of it's own. Sir Francis Bacon asserts that hee saw the Heart of a Traytor pluck'd

out of the Body by the executioner that retain'd a manifest palpitation for ¼ of an hower after. But this is more admirable by farre in Fishes, Snakes, Vipers, Toads, Froggs and such frigid Animals. Constantinus delivers that hee observ'd the Heart of a Salmon exenterated to beat for 24 howers togeather. Wee have cutt out the Heart of a Snake, and layd it upon a Plate and observ'd it to retaine it's motion 7 or 8 howers at the least, though that of an Eele wee have known to double the Time, and to live 14 howers. Sir Kenelme Digby observ'd the Heart of a viper layd upon a warme plate in a warme place to outlive the Ephemera of Pliny, and to beate 24 howers at the least.

Yea though the Heart in any Creature be subdevided and minced into many parts, yet will they all have their peculiar Motion and immitate as farr as they possibly can the contraction and dilatation of the whole.

CAP. 2.

Exp[eriment] 14.

When the Heart is in it's Systole or Contraction, then doe all the Arteryes of the Body pulse, and are in their Dilatation.

Exp[eriment] 15.

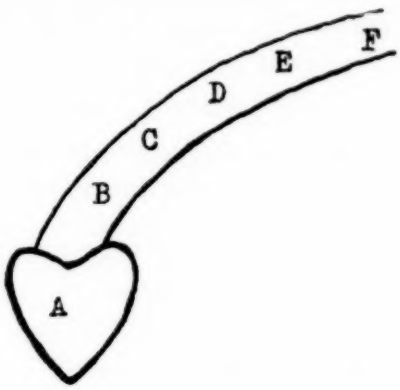
In Dying Animalls when the left ventricle has ceased from it's motion, then likewise does the pulse of the Arteryes. Yea in the languid palpitation's of this ventricle, the pulse is scarce perceptible, as wee see in swoundings and sipothytry's semblablely in the cessation for vermiculant motion[17] of the right ventricle the like is observable in the Arteriall veine or pulmonary Artery. vide experimentum de Angue vivo.

Exp[eriment] 16.

The pulse of the Arteryes in the Body, both in their trunk, branches, twigges, and capillarys' is Simultaneous or perform'd in one and the same instant, for feele the pulse in your wrist with one hand, and lay the other to any other convenient artery as the jugular, and you shall perceive them to pulse exactly in the same Instant, which may also be observ'd in any of the Intrinsecall[18] Arteryes in living dissections. The Cause whereof is Easyly demonstrable, for Suppose A to bee the Heart, B.C.E.F. to bee the Aortall

17 Syncope and exhaustion and similarly in the cessation of pulsating motion.
18 Internal.

Artery, full of blood (as it always is). Now if any new blood be propuls'd from the Heart A, wee may easily see that it Cannot enter into B (the orifice of the great Artery), unlesse the blood there prae-contain'd, doe re-cede towards C, and so protrude the other parts of the blood to E and so consequently to F, so that at the very Same Instant that the blood ascends from A to B the Artery ought to pulse in F, and so if it were never so long, or splitt into never so many branches.



Exp[eriment] 17.

Infinite almost are the Causes, that may vary the vigour, Smartnesse and frequency of the pulse. Hence arises that Discordance and jarring in Authors Concerning the Horary pulses, Primerose asserts hee numbred not above 700 pulses in 1 Hower. Harvey, Walleus and De Roy 3000 or thereabout's, Cardan avouches 4000. Fromond from the experiment of his own arme 4450. Plempius stretches farther yet, and delivers that hee Computed in his own wrist 5376. And indeed sometime the pulse will goe at a Notable Rate, but especially in feavourish and acute Diseases. Howell asserts' that it has being observ'd to beat in a prae p[ro][19] acute feavour 30000 times in 1 hower.

Our experience comes the closest to Cardan for wee have often try'd by a minute-clock and found about 4000 pulses to passe in 1 hower.

In most Quadrupeds' the pulse come neare to the stroake of mans, as may be easyly try'd in grey-hounds whose heart (by reason of their lank and shotten[20] Carcase) may easyly be felt to beat

[19] High.
[20] Emaciated.

through their ribbs. Yea the Severall and distinct pulsations thereof may be easyly seene in the posture of their Decumbency.

Exp[eriment] 18.

The Arteriall veine or rather pulmonary Artery, being open'd with a lancett; just at the Same time that the Right ventricle shrinks into Contraction you shall see a streame of blood to start out of the orifice, and least the blood through the same channell should regurgitate back into the Heart againe the 3 Sigmoidall valves are fix'd in the orifice thereof to secure the Heart from the danger of such relapses.

Exp[eriment] 19.

Likewise if you Prick the Aorta, or any other Artery throughout all the Body, you shall see the blood to jumpe out at every systole of the left ventricle, and for the same feare of regurgitation, least the Heart might be suffocated thereby 3 semilunary valves are annexed to the rise and orifice of the Aorta, whose Position is such that Any thing may passe out of the Heart, in to the Aorta, but nothing regurgitate againe.

Exp[eriment] 20.

Upon the Dissection of the Thorax and Collapsion of the lungs which immediately follow upon opening of that Region and so consequently the losse of respiration, you shall perceive the blood to lessen in every ejaculation, and be discharg'd by a weaker and weaker and weaker pulse, till at last (the blood failing, and the impulse of the left ventricle and it's auricle ceasing) both the glux[21] and receprocall ejaculation of the blood be utterly sufflaminated[22] which playnly demonstrates that the blood chanells only by tranation[23] through the pores and substance of the lungs into the left Auricle which being the Convenient measure for the left as the right is for the other ventricle does alwayes eject a Convenient Quantity into its appendent ventricle.

And which is further observable this transit of the blood through the lobes and Body of the lungs wholy ceases upon their collapsion and Quiescency because then the pores are obstructed, which in their motion and dilation give addmittance to the fluid particles of blood.

21 ? Flux, flow.
22 Obstructed.
23 Penetration.

Exp[eriment 20a.]

This likewise is made good in Fishes, for if you prick that Pipe, with a Lancett, which runs from the Heart to the gills, (and is analogall to the Aorta in other Animals) you shall perceive the blood to be cast out at every Contraction of their Heart very manifestly.

This gill-spout[24] in fishes also wants not it's valves to secure the Heart from the regurgitancy of the blood, though wee could never discover above 2 in that place, which are very Eminent in Salmons.

of the Arteryes and their pulse.

Exp[eriment] 21.

If in the dissection of a living Dogge you transversly Cutt the Aorta quite in two, you shall perceive $\bar{3}$[25] of blood more or lesse to be ejaculated at every pulse and at last the whole masse of blood in his body will through that shall be totally exhausted.

Exp[eriment 21a.]

So if you cutt the pulmonary artery from the right ventricle, you shall see at every Systole what Quantity of blood is usually propuls'd into it.

Exp[eriment] 22.

The jugular, or Carotidall Artery in a living Dogge being open'd (in the Same manner as Butchers use to doe in killing of Sheepe or Swine) and a vessell set to receive the blood you shall perceive in a short time the whole masse of blood in the Animal to be exhausted at that orifice, which you will find not to exceed 4 lbs at the utmost. Wee have seene the blood of a sheepe in the Scales just to ballance 4 lbs (which Harvey likewise has prae-observ'd) Haverdupois-weight, the blood of a Cow (9 or 10 yeares old) not to outweigh 33 lbs, in an oxe . . ., in a Swine . . . Now what the blood in a man weighs (since wee cannot have a Seneca or a Lucan to make good the experiment) is hardly determinable. Yet is the whole Quantity of blood in a man's Body of a Sound Constitution and middle Stature, very rarionally[26] aestimated to be about 3 gallons or 12 quarts or 25 lbs, allowing somewhat lesse[27]

[24] Ventral aorta.
[25] Half-ounce. This was Harvey's estimate.
[26] Reasonably.
[27] Should be more. The latter part of this paragraph is obscure and the estimate of three gallons is excessive.

then a lb to a pint, insomuch as 1 pint of water weigh's 16 ounces, which Quantity is made good from the exceeding losse of blood in excessive and prodigious Haemorrhagia's, in women by the uterine, in men by the Haemorrhodiall veines and in both sometimes by bleeding at the Nose, and therefor both Avicen and Botallus avouch this Quantity.

Exp[eriment] 23.

If you transversely cutt the jugular Artery, so that the blood may gush out at a large orifice, you shall perceive little or no pulse or vibration of the Artery, for the blood running out as fast as it is push'd into the channell of the Artery, it does not at all stretch, or distend the coat thereof, and so consequently no pulsation ensues, whereas before the experiment was made, the blood being alwayes propuls'd out of a greater chanell into a lesser (viz. from the Aortall Trunk into the Branches, and thence into the Capillaryes) could not chuse but distend the lesser vessells, to make roome for itselfe and so produce the Diastole or pulse of the Arteryes, which experiment does not only show that the arteryes have no innate pulsificall faculty of their own, or influentially Communicated from the Heart to them (according to the Dreames of the Ancients), but also palpablely exhibits a reason for the non pulsation of the veines, wherein the blood just passing in a contrary manner, through the vessells (viz. from lesser in to greater chanells), it does not at all distend their cavityes, and so consequently exhibit's no pulsation.

Of the Lungs and their motion.

[Experiment 23a.]

In the dissection of the thorax many different observation's in the lungs may be made by the Zootomist for if the dissection be made in the middle of the Thorax from the sternon upward and with a wide gash so that the Mediastinum be quite cutt and spoyled that the extrinsecall aire may have a free ingresse to both Cavityes of the thorax, then you shall presently perceive a totall Collapsion and subsidency of the lungs.

If one side onely of the thorax be perforated then the lobes of the lungs which lye on that side will presently cease from their motion. The other halfe of the lungs on the other side of the mediastinum wee have observed to move a long time after. If the wound enflicted or perfortion on either side be not very consider-

able so that the externall aire Cannot push suddainly in, then the motion of that halfe of the lungs, where the orifice is made will continue a long time, yea and some times [?] will be agitated with such violence that a piece of the lobe will passe out at the orifice. From which exp[eriment] it is Autoptically[28] demonstrable that the motion of the lungs proceeds not from any intrinsecall principle of their own (for then they would manifest it after the dissection of the thorax as the Heart does) but are meerely expanded and contracted according to the alternate dilatations and constriction's of the thorax, and at the command of the Inter-costall muscles, which by a kind of familia[29] violence, doe incessantly (during life) worke those effects of Respiration which wee perceive.

And therefore though the lungs of birds (being analogous in office to ours), be closely annexed by many visible fibres and chained to the ribbs so that they cannot possiblely have any liberall and free motion of their own, yet doe they suffer thereby no asmatick disease or incurre the difficulty of respiration, because they are always distended and re-Compressed by the Command and motion of the thorax; which Connascency[30] of the lungs to the pleura has beene observ'd also in men, by Columbus, Helmont and Plempius, none of which Persons ever Complaynd of a Dyspnaea or any such like pulmonary malady.

If immediately after the lungs are collapsed you slitt the Aorta up untyll you shall perceive the blood to lessen in every ejaculation, and to be discharged by a weaker and weaker pulse till at last the blood totally failing and the impulse of the left ventricle and it's auricle ceasing if you cutt the trachea and blow up the lungs for some little continuance of time you shall see the left auricle and its ventricle to re-assume their former strength and vigour and a new flux and channell of blood to returne into the Aorta againe.

Exp[eriment] 24.

When an Aneurisme follows upon arteriotomy there is the same pulse perceivable with that of the arteryes, when as[31] the extravasated blood, has no arteriall coat to cover and envelop it, to whose innate pulsificall faculty, that aneurismaticall motion or pulsation might be attributed.

28 Visually.
29 Habitual.
30 Congenital union.
31 Although.

Exp[eriment] 25.

The Arteryes the farther they are branch'd and divaricated from the Heart, they approach nearer to a venall Constitution, so that in their Extreame twiggs and capillary sub-divisions, they are not at all in substance distinguishable one from another, and in frigid Animals, the veines and arteryes are, both in their trunk and branches, of a Similar and homogeneous Constitution.

Exp[eriment] 26.

If you cast a ligature on the Aorta, and then slitt the Artery with a lancett length-wayes a little below the tye, and thrust up a piece of a sponge into the tubulous Cavity thereof you shall (after the removall of the ligature) cleerely perceive a strong and vigorous pulsation of the Artery, above the spongy obstacle, but below no motion of the Artery at all, whereas if the sphygmoidall Concussion[32] or pulsatile motion of the Artery was derivative from the Heart (and did not meerely proceed from the undulation of the blood) it would be sensible in the whole trunk of the Artery, since the arteriall Coat is at liberty and no ligature intercepts the influence in this exp[eriment].

Exp[eriment] 27.

If you cast a ligature upon any Artery in all the Body, immediately you shall perceive a vehament intumescency twixt the ligature and the Heart, but on the other side of the ligature a manifest Detumescency, and totall inanition of the Artery, which is not only confirmable in all the branches and divarieations of the Aorta but also Autoptically Demonstrable in the pulmonary artery too which chanells the blood from the right ventricle to the lungs.

Exp[eriment] 28.

If any Artery be prick'd with a lancett twixt the ligature and the Heart, you shall see the blood to start out at every pulse to a Considerable distance, whereas Contraryly if the Artery be breathed[33] and the orifice made on the opposite side of the ligature there will follow no effusion of blood at all.

Exp[eriment] 29.

If you cast a vehement and painfull ligature upon any mans arme, you shall presently perceive the pulse in the wrist to cease,

32 Pulse beat.
33 Lanced.

and no arteriall motion at all to be found in any part of the Arme below the ligature, when in the Interim the parts above suffer a vehement distention, and the blood in them even strives as it were to break through the resistance. Now if immediately (upon solution of the Ligature) you clappe your finger to the wrist, you shall very sensiblely perceive the Comming blood to slide under, and a returne of the pulse againe. The Patient in the interim, who undergoes the experiment shall evidently perceive the Heat and Spirits to returne with the blood into the benum'd parts.

Exp[eriment] 30.

When the Phlebotomist Casts a moderate ligature upon the arme, you shall not only perceive a tubulous intumescency of the veines below the ligature, but also an Inflation and swelling and rednesse of all the musculous and fleshy parts besides which demonstrates the percribration[34] of the blood through the porosityes and habit[35] of the Body, and not merely its transvasation by venall and arteriall Inosculations.

That part of Anatomicall administration which is perform'd by Ligatures.

Plempius being angry at the over-pendulous contrivance of the eielids, is bold to affrme, that if hee had the contrivance of them, hee would have made them quite other wayes.

Exp[eriment 31.]

If immediately upon dissection of the thorax you cast a ligature upon the pulmonary artery, you shall perceive in the left Auricle and it's ventricle, a languid and fainting pulse and presently after a totall inanition of blood and cessation from motion. Then immediately if you loose the Ligature, and Cutting the trachaea, shall blow up the lungs, that the blood may percirbrate through them (aye it cannot passe[36] [illegible] and therefore though Dr. Harvey in the delivery of this experiment, doe not at all mention the Inflation of the lungs, yet Questionlesse, it must be donne, else the exp[eriment] will not succeed) the colour and pulse shall be again restor'd and a fresh supply of blood ejaculated into the Heart [. . . ventricle] againe. As that[37] wee must be forc'd

34 Sieve-like motion.
35 Fabric.
36 This must mean that it cannot pass direct but only by filtration.
37 Hence.

to confesse the filtration of the blood through the lungs unlesse wee be so arrogant and peremptory to deny inspection and the infallible demonstrations of sense.

CAP. 3.

of the veines and their valves.

Exp[eriment] 1.

If you cast a ligature upon the vena cava, or any other veine througout all the Body, whether it be branch'd from the Cava or Porta the Intumescency and Detumescency will appeare just Contrary to that of the Arteryes for beyond the ligature (or towards the extremityes of the Body, will presently arise an Intumescence, whereas on this side of the ligature that is 'twixt it and the Heart, a Detumescence and totall inanition. The like also may be easyly experimented in Rabbitts in the pulmonary veine.

Exp[eriment] 2.

If in any mans arme you stoppe any Conspicuous veine not farre of the wrist, with one hand, and then with the other protrude the blood forwards toward the Heart, you shall see the trunke of the veine to undergoe a totall depletion and inanition, which will in no wise be supply'd or recruited, by the removeall of that hand that drive it upwards, but immediately upon the shifting of the others, the chanell will againe returne, and the veine to it's wonted intumescency. Well then suppose you repeated this experiment 1000 times or more, you will find by a rationall supputation,[38] that in a few minutes there is more blood transmitted through the tube or Chanell of this one veine, than the whole arme is able to supply or can possiblely containe. Yea (if the *exp[eriment]* be continued) then the whole masse of blood in the body is able to recruite.[39]

This experiment you may easyly try in the veines on the backe side of your own hand, stopping the chanell with your finger neere the knuckles and protruding the blood with your thumbe towards the Heart.

Exp[eriment] 3.

In phlebotomy after they have Cast a gentle ligature on the Arme, they breath[40] the veine alwayes below the ligature, where the venall intumescence is most palpable, and the blood thence

38 Calculation.
39 Provide.
40 Lance.

flows out largely in a Continued streame, through which orifice the whole blood in the body may easyly be drain'd and exhausted whereas if you breath the veins on the other side of the ligature, no flux of blood at all will ensue. Now if in the time of the Patient's bleeding you stoppe the veine with your finger beyond[41] the orifice, the chanell will cease and the flux of blood be instantly sufflaminated,[42] whereas if you stoppe any part of the veine 'twixt the orifice and the ligature, no alteration at all will ensue (but rather a greater streame of blood than formerly will Spring out at the orifice).

Exp[eriment] 4.

As for the valves annex'd to the inmost Coate of the veines (wheather you ascribe to Fab[ricius] Aquapendens, or Joh. Silvius the Honour of their Invention,[43] An.D. 1574) they are known by all Anatomists, to bee tenuous and transparent filmes of a Semilunary figure, just like those in the orifice of the Aorta, sited at various and irregular distances for the most part by Couples, though sometimes a ternary or gleeke[44] of valves are discoverable in the Crurall and jugular veines, yea and sometimes a murnevall[45] rank'd in the same order and with the like accuratenesse as the Heart-valves are, looking alwayes with this orifice towards the Heart, so that they give a free passage, and permittance to the venall blood to run to the heart, but hinder the reflux of any thing from the heart towards the extremityes of the Body: of the truth whereof you may be ocularly Confirm'd by this experiment.

Exp[eriment] 5.

Cast a gentle ligature upon the arme, as they use to doe in Phlebotomy, and instantly, besides the aequall and cylindricall Intumescency of the veines, there will arise (especially in rusticall[46] and raw-bon'd bodyes) little knotts and tumours in the veines: so that if you offer to thrust back the blood (which then restagnates[47] in the veines) from the Heart towards the extremityes of the Body, these tumours and eminencyes (which are nothing but the venall

41 Should be below.
42 Obstructed.
43 Amatus Lusitanus described the valve of the azygos vein in 1551, but the valves of the veins were already known to Canano in 1546 thlough not published by him.
44 Trio.
45 Set of four.
46 Robust.
47 Remains stagnant.

valves) will swell with a strong resistance and totally frustrate your endeavours.

That these valves hinder the regurgitancy and relapse of the venall Blood is evident in Chacochymicall[48] and Scorbuticall Bodys which are troubled with those Knotts in their leggs which we call the Varices, where the faeculent and ponderous melancholy Blood falling down towards the feet, restagnates[47] in those resisting pellocles.

Exp[eriment] 6.

Which thing also you may observe in Carcases for if you search out any veine, where these valves are fixed, and presse the blood backwards with your finger, you shall see how closely they will shutt the tube or Cavity of the veine, that not the least drop shall passe their resistance. Nay if you squeese all the Blood out of the veine and blow it up contrary to the position of the valve, it will give so close a resistance that no aire shall passe by it.

[Experiment] 7.

These membranulous Epiphyses[49] or Labells annex'd to the veines are to be found in most parts of the Body, as in the emulgents Coronary of the Heart Internall jugulars, the Ductus splenicus omentall and Spermaticall and mesentericall veines. In the Azugos also, wherein Riolan deliv[ers] hee discover'd a very faire paire neare the orifice, and a Single one to boot in the Body or trunk thereof, all looking into the Cava. Wee have likewise in a Dogge found a paire of valves there, as faire and large as those in his cruralls. But indeed they are annex'd most frequently to the Axillary, Brachiall and Crurall veines; not only to resist the reflux and regurgitancy of the blood in those utmost parts (to which it is often incited by the inordinate motion of those organs. But also to promote and helpe forwards the returne or ascent of blood to the Heart againe, which is mechanically demonstrable in pump's and Syphons in which the ascent of the water is wrought with farre more ease by helpe of valves then without them.

[Experiment] 8.

Neither are these valvular crescents peculiar[ly] Design'd to the veines, but are also discoverable in other vessells of the Body, as in the chyliferons, or lacteous chanells of Asellius, as wee shall

48 ? Chemical obstruction.
49 Appendages (valves).

afterward's declare. Bartholinus and Veslingius, deliver that a very faire and Eminent valve is fix'd in the Pancreatick tube or chanell of Wirsungus,[50] looking with it's Orifice directly into the Duodenum, so that anything may passe out of this chanell into the gutts but nothing contrary-wise.

Plempius in his chap[ter] de Pancreate where hee elegantly describes this glandule, makes no expresse at all of this valve, either in the Cutt or letter. Riolanus enither in his Anthropography, Enchiridion, nor criticall animadversions upon the Neotericall[51] Anatomist's (in which piece if any where wee might have expected some satisfaction) delivers not the least syllable of it. De Back utterly overthrows it, for hee delivers that if a Ligature, in Living dissection, (some 4 or 5 howers after meate) be cast upon this chanell, it will swell egregiously toward's the gutts (being full of a Lacteous Humour), but on the other side towards the spleen, absolutely subside, which cannot possiblely bee unlesse the valve (if there be any such thing) have a counter position, as they in the rest of the Lacteall Veines have, of this probablely[52] may be thought the greatest, as wee shall after-wards declare with the like easynesse and incircumspection[53] are their valves sayd to be in the cholidicall chanell ductus Cysticus or Neck of the gall bladder, generally received and believed, and therefore are magisterially deliver'd by Bartholinus, de Roy and Veslingius, to be fix'd with their orifices towards the Duodenum or jejunum, to hinder the Re-course of the gall, or it's regurgitancy into the bladder and liver againe.

Riolanus and Plempius (two exquisite Anatomists) protest they have often attempted the Discovery of these valves in Humane Dissections, but could never find the least resemblance of them, to whome indeed our experience must needs assent in all other Animals, for having often made an Incision into the basis of the gall-bladder (both in doggs, foxes, and other Animals) and thrust a probe through the meatus Com[munis] Choledochus into the Duodenum, and then slitting it with a lancett Length-wayes, wee could never neither in this or in the Ductus Hepaticus discover any valves at all.[54]

50 There is no valve in the pancreatic duct.

51 Modern.

52 This long and involved sentence seems to require probability here.

53 Incaution.

54 Power is right here if we except the so-called spiral valve of the neck of the bladder and the cystic duct which is not a typical semilunar valve.

[*Experiment*] 9.

As for Arteriall Valves (excepting those in the rise of the pulmonary and great Artery) wee could never discover any, yet Bartholinus asserts hee once saw a rude kind of valve in an artery of the Arme. And Riolanus flattly maintaines one to be alwayes discoverable at the rise of the Coronal artery if it be Single and not double trunk'd. Neither indeed are these valvular Contrivances or Corniculated membranes requisite in the Arteryes because their pulse or Distention is perform'd through all their divarications at once (per experimentum) and so their contraction likewise by alternate moments. Againe many doe assert, and some doe peremptory maintaine, that there are valves just at the insertion, or implantation of the ureters into the bladder, which (like the Transverse Membranes in Bellows) doe freely open to receive the urine but doe so closely shutt if it attempt to regurgitate that one drop of urine cannot relapse into the ureters againe: and this is Anatomically deliver'd by no less Anatomist's then Bartholinus. Now Riolanus and Plempius (which seldome take anything upon trust) manifest it to bee a mere figment, to whom (if you will believe your eies, you must necessaryly attend. For if you trace the ureters, and accurately observe their insertion, you shall find them to run obliquely just betweene the two proper Coates and membranes of the bladder, and so the urine to drop into the bladder, through this Sinuous, and intercutaneous Implantation, so that by how much the bladder is distended, either with water or wind, by so much more strongly are these contiguous membranes Conglutinated, and so cannot possiblely lett anything reflux, or brake back into the Ureters againe.[55]

[*Experiment*] 10.

There is no lesse bickering amongst Anatomists in their splanchnology, about the valve of the Colon (attributed to Bauhin the Inventor—An. 1579 or rather to the prae-discovery of Varolius 1572 as Riolanus will have it)[56] Bauhinus and Bartholin both in their Book and pictures describe it to be a Concave and membranaceous sack or purse, just like the venall valves, whereas in the

55 Power describes correctly the oblique perforation of the bladder by the ureters, and notes that the upper and lower walls of the terminal portion of the ureters act as valves without being true valves as usually understood.

56 G. Bauhin claims to have seen and demonstrated the ileocecal valve in 1579, but he did not publish a description of it until some years later. He had several predecessors in the discovery of this so-called valve, which probably acts as a sphincter. Fallopius describes it in 1553 in an unpublished manuscript. Varolius' date should be 1573.

seriousnesse of truth, and by the testimony of ocular Inspection it is no such thing, for it is only a Circular, membraneous excrescence, as it were tuck'd up and made by the mutuall Connection of the Ileum and Colon, and therefore in the middle 'tis perforated like a ring, which opens and gives way to the excrements tending towards excretion and then shutts againe to hinder their relapse just like that carneous circle of the pylorus, so that it is not so great a miracle that sometimes by the preternaturall Peristaltick motion of the gutts a glyster[57] should be rejected at the mouth, without any considerable detriment or danger to the Patient for this orbicular valve by relaxation might easyly give way to it of which odde kind of Accident Plempius asserts hee was once an ocular witnesse and Primrose likewise in his vulgar errors: Wee ourselves also Can attest the Certainty hereof for wee have seene the violent ejection of a clyster at the mouth.

Nay sometimes this Counter-motion of the gutts is so violent that Gradius sayes hee saw a supposi[tory] vomited out at the mouth.

Plempius indeed assert's that in 3 or 4 severall Bodyes by him dissected hee hath found this Intestine valve, exactly both in forme, figure and Concavity like the venall ones.

Exp[eriment] 11.

Lastly there is yet one valve more which hath bred much Quarrelling amongst the Anatomists and that Bartholinus from Bauhinus affermes to be fix'd in that short Cartilaginous tube or chanell, which shoot's itselfe from the Tympanum or Drum of the eare into the palate, looking with it's orifice directly into the mouth, so that the Phlegmatick Mucus or excrementitious humours collected in the cavity of the eares, may easyly slide into the palate, or be ferrelled out thence by virtue of masticatory pills or tabletts (which are patt and hopefull Remedyes in such obstructions of the eares) but nothing (because of the resistency of this valve), can passe from the palate towards the tympanum. Veslingius and most other Anatomist's never make the least mention of this valve and Riolanus in his Criticall Notes upon that chapter of Bartholin boldly asserts that Bartholinus never saw it, to whome also we are Compell'd to assent, for besides the uselesse position of that valve there, (nothing by reason of it's resistancy could passe from the Palate to the Tympanum, yet wee (as well as Riolan and Ves-

[57] Formerly spelt with a g as here.

lingius) have seene one blow divers guiffts[58] of tobacco out of his mouth through his eares, which could not possiblely be effected upon the concession of Bartholinus his valve for wee see that the venall valves upon a contrary inflation, will shutt so close that they will not so much as lett aire passe by them.[59]

And these are the observations and experiments discovered by Zootomists in their living dissections, which wee have prefixed as the fundamentall axioms and Canon's to which wee must have recourse in the progresse of the circulation, which wee shall now evince not upon precarious and petitionary principles,[60] but from Autopsy and inspection and not by helpe of a subtill and oyly tongue insinuate this new doctrine into weaker judgments. But from Apodicticall[61] Arguments and Anatomicall evictions[62] and Demonstrations force assent and applause even from prejudicale beliefes.

The Blood therefore is sayd to circulate around the Body not that it absolves[63] a mathematicall circle, but that it makes Continuall and reiterated returnes to that part from which it first tooke it's rise and motion, viz. the Heart.[64]

Which mystery wee thus orderly demonstrate. Both Auricles in their constrictions doe always ejaculate a certaine quantity of blood into the Heart, the one into the right the other into the left Cavity. Per experimentum.

Most of this Auricular Blood, is continually expelled out of the Heart by it's incessant systolicall motions and alternate constrictions into the Arteryes, part into the pulmoniacall and part into the great Artery. Per experimentum.

Now if wee make a rationall supputation[65] what Quantity the left ventricle only expells at every systole or constriction ʒ or 4 drams is the least imaginable per experimentum yet that our demonstration may bee more credible wee will condescend so farr[66] in our Hypothesis as to suppose ℈[67] only to be ejected at every pulse. Now it being evident and an experiment tryable at every hand, that the pulse in a moderate temperament beats 3000 times

58 Puffs.

59 There is no valve in the Eustachian tube, nor is it possible in normal conditions for smoke to pass via this tube fromthe mouth and out at the external ear.

60 Unproved assumptions.

61 Absolutely convincing.

62 Proofs.

63 Completes.

64 As usual at the time, the term heart includes the ventricles only.

65 Calculation.

66 ? So far.

67 One scruple.

more or lesse in 1 hower (per experimentum), it will follow all being sum'd up by impartiall arithmetick that the blood propulsd out of the Heart into the Arteryes in 1 hower will be lib: x and ℥v[68] in 2 howers approximately 21 lib. which is more blood than is contain'd in the whole magazine of man (per experimentum) and therefore can be made out no other way but by circulation.

So likewise in a Dogge or Sheepe supposing the Heart to discharge at every systole but ℈ʔ[69] (which is the least imaginable) then it will follow that in every hower 1000 Scruples is at least ejected because the Heart of a Dogge beats at a rate of 2 or 3000 times an hower (as may be easily experimented in grey-Hounds by reason of their lank and shotten carkases) which quantity comes very neare the whole masse of blood containd in those Animals.

Now though the pulse and Contraction of both ventricles be perform'd in one and the same instant, yet that wee may bee more intelligible wee will handle them in a distinct and separate consideration.

The Blood therefore (as wee have formerly declared) is propulsed out of the right ventricle into the pulmonary artery, and thence by subsequent pulsations (nothing being able because of the sigmoidall valves to regurgitate) into the Body of the Lungs, where either by synastomoses or percribration through the spongy and porous substance of the lungs (for no third way can be imagined much lesse Demonstrated) it is received into the Branches and trunk of the pulmonary Veine and so passeth through the left Auricle (and not through the Septum cord [is] per experimentum) into the left ventricle. From thence being not able to regurgitate because of the mitrall valves it is at every pulse of the Heart expelled into the Aorta. Which Zootomicall experiments Cannot chuse but force the Ingenous experentator to the Confession of these ensuing truths unlesse hee be so arrogant vid pag.

First that the blood passeth from the right ventricle of the heart through the lungs into the left ventricle and not through the partition-wall of the heart.

Secondly that the blood passeth by filtration or percribration through the very Body and Spongious substance of the lungs into

[68] Ten pounds five ounces.

[69] One half scruple. This paragraph is a modification of Harvey's figures given in Chapter IX of the *De motu cordis*. Both Harvey and Power fail completely to estimate accurately the volume and speed of the circulating blood. "Descartes (1662), accepting the circulation, speaks of the blood returning to the heart 'drop by drop.' But in violent exercise a volume of blood five times the whole of that within the body may race through the heart each minute." (Sherrington.)

the branches of the pulmonary veine, for if it passed by synanastomoses of the pulmonary veine and artery the Quiescency of the lungs would not hinder its motion into such inosculations.

Thirdly that this transition, or tranation[70] of the blood through the lobes and Body of the lungs wholly ceases upon their Collapsion, and Quiescency, because then the pores are obstructed, which in their motion and dilatation gave admittance to the fused particles of blood.

Fourthly that though the motion of the heart be proper and intrinsicall, yet it receives some addition and benefitt from the blood, for wee see in this experiment upon the returne of the blood againe to the left auricle and left ventricle they re-assume their lost pulsations, and begin to recover as it were a new life again.

In embryo's though where the lungs enjoy a Continuall rest and are not vexed with the uncessant reciprocations of respiration Nature has Contrived a peculiar Circulation for having accomodated them with 2 peculiar passages. (viz. the Synanastomosis, or Coniosculation of the vena cava with the pulmonary veine first dis. by Botallus, and likewise an arterious channell that unites the pulmonary and great Artery Togeather.)[71] The venall Blood, (viz. that of the Cava) runs through for the most part this Synanastomosis into the pulmonary veine, and so into the left ventricle; the other part slides into the right ventricle and is not thence Carryed by the pulmonary Artery through the lungs but is for the most part by this laterall Arterious channell discharged into the aorta, as much only going to the lungs as serve for their nutrition. The reason of this irregular contamation may easyly be Collected from exp[eriment].

Viz. because the pores of the lungs in their relaxation and flaccescency are totally obstructed, that they could give noe admittance to the blood to uphold the Circulation, and therefore nature was forced to this strange Contrivance and peculiar aeconomy in the Infancy of hir Circulation, which kind of peculiar Conformation and Connection of vessells your Amphibious and water-Animal[s] (viz. Such as Can live a long while under water without the assistance of respiration) retaine all their life-time perfect and en-

70 Penetration.

71 Botallus erroneously believed that he had discovered in the foetus a new passage of the blood from the vena cava into the left auricle via the pulmonary vein. This was considered and rejected by Harvey. The substance of this passage generally was more clearly expressed by Harvey. Power's comparison of the non-pulmonary circulation of the human foetus with that of some lower vertebrates which can live for a long time under water ignores the fact that these types possess lungs which must derive their blood supply direct from the heart.

tire which two Anomalous observations doe quite stiffle the Conceits of those that will have the blood to passe through the septum from one ventricle to another, for if that were true to what purpose were these supernumerous vessells in Infants Contrived or in amphybious animals retained, Since Nature might have gone a farre nearer Cutt (through the Septum) to the performance of the Circulation. Now in such animals as have but one ventricle (as all the lesser fry of fishes, toads, froggs, snayles, vipers etc the blood in them, immediately after the Auricle[72] has discharged it into the Heart is ejaculated and propulsed into the aorta, for there is no other way for it to goe.

Having now pursued the blood through these Subtill labyrinths into the orifice of the Aorta it Cannot thence regurgitate into the Heart againe because of the resistency of the Semilunary valves per Exp[erimentum] and being and being Constantly protruded forward by the subsequent and uncessant pulsations of the Heart it is dispersed by the Branches, surcles and capillaryes of the Aorta, throughout every part of the Body to be nourished.

Now the trunk of the Aorta being always full charged the blood that is excluded at every systole of the Hart protrudes that forward to make roome for itselfe and so the Subsequent parts still protruding the precedent Cause that motion of undulation and subsaliency[73] of the blood in the arteryes which wee Call the Pulse.

The Blood thus arriving at the Circumference or extremityes of the Body by helpe or mediation of the arteryes; is againe return'd or Convey'd back from the Periphery to the Centre (viz. the Heart) againe by the tubulous Conducts of the veines as is evenced and demonstrated beyond all hopes of Contradiction by Exp[eriment].

So that the veines receiving the blood from the Arterys at last discharge it into their maine trunk and Body (viz the Cava), and thene through the right Auricle it flowes into the Heart againe and so by this Continued and reiterated returne makes good the Circulation.

Now the only mystery to compleate this Circulatory motion, yet to be discovered is to explayne by what meanes the arteriall blood insuates itselfe into the veines and by what artifice and Contrivance in Nature the Connection of these 2 Contrary motions is performed: Riolanus, Cornelius van Hoogheland, Des-Cartes and

72 As with Harvey, Power is not aware that the lower vertebrata (apart from fishes) have two auricles in the heart.

73 Pulsation.

his strong avoucher and Convert H. De Roy will have the returne of the blood to be performed only by Synanastomoses, or Conioscu-lations of the arteryes with the veines and so the Arteriall blood by this Continuation to be immediately transvasated or transmitted into the veines and so to performe the Circulation.

Walaeus, de Back, Pecquet and his Hyperaspistes* Guiffartus ghett a little farther in their beliefe for they allow part of the arteriall blood indeed to be returned immediately by synanasto-moses but they will have also a great part of it to be percribrated and streind through the pores of the flesh, and musculous parts of the Body and so partly by the iterated ebullision[74] and continuall protrusion and systolicall impulsion of the arteriall blood, partly by the syphonicall action of the veines and arteryes, by the Spontaneous Contraction of the parts distended with too much blood and partly by the voluntary Motion of the muscles is mediately squeesed and percribrated through the flesh into the Capillary extremityes and orifices of the veines,[75] just as I suppose the chyle by the continuall motion of the Diaphragme pistillation[76] of the liver or Constrictive fibers of the stomach and galls and pres-sure of the adjacent parts is squeesed into the orifices of the Lacteae.

[CAP. 4.]

Exp[eriment] 1.

In excarnated livers (and likewise in the Divarications of veines and Arteryes in other parts of the Bodye) I have seene a Cohesion and union of the veines and arteryes and especially of the Portall Branches with those of the Cava, the one sometimes by a Laterall adhaesion and Contiguity cleaving to the other, sometimes the one being surmounted crossewise by the other, and sometimes this one Disgoreing as it were, its mouth and orifice (like the letter T) into the tube of the other: yet I could never discover the least sensible miscalcution open'd whereby the one by any sensible orifice dis-gorged the blood into the other, which our famous Professour[77]

* Champion.

74 Boiling.

75 Note that Power refers to the capillary extremities and orifices of the veins. The blood capillaries were discovered by Malpighi in 1661. Further on Power makes it quite clear that in his opinion the arterial blood must pass through an intervening spongy sub-stance before it can reach the veins. This is Harvey. Power had no conception of dif-fusion and absorption through the walls of capillary vessels, and hence no conception of a capillary system.

76 Pounding.

77 Glisson, 1654, cap. XXXIII. Power's manuscript is dated 1652 which requires some explanation.

hath Since Confirmd as is observable in the Synanastomosis of the Embryo. Indeed 'tis observable (what the noble Harvey has also predelivered) that the branches of the Cava which creepe through the Convex and gibbous part of the Liver have their Coates often drilled through with numerous perforations like pinholes through which the extravagated blood (viz that which is diffused through the Parenchyma of the liver) percribrates and trickles into the vessells of the vena cava.[78]

Therefore there only remaines the other part of the Disjunction to be embraced, viz. that the transvasation (or elutriation[79] to use Plinyes terme) of the blood is performed by percolation or transcribration through the Spongious Substance and poresityes of the flesh; for no third way is imaginable.[80] And indeed if the Circulation were performed any other way, how can wee Conceive every particle of the flesh and muscles of the body Can be nourished, for tis required that the alimentary humour should percribrate and diffuse it selfe, through every particle and atome of the Parts to be nourished as wee see the blood doth in the Body, there being not the least particle or atome of fiber which is not continually irrigated with this humour, as wee absolutely see the nutrititous juice does in plants and vegetables for there it runns out of the Capillary fibers, and diffuseth it selfe into every atome and particle of the leafe or fleshy parts of the plant, as may easyly be observed in the greater Celandine, Dan-Delion and all kind of spurges, and such like Hearbs where the alimentitious humour is of another Colour than the Plant it selfe.

Againe that the blood is thus elutriated into the veines by transcolation through the flesh is manifest in the lungs per *Exp* [erimentum] and so a similar probably may passe through the substance of other parts.

Inventa ab Authore An: Dom: 1614

Now therefore to draw into a lesser Circle and to wheele once more with the blood round about the Body. Take it thus Briefely.

The Right auricle receiveing a Continuall supply of blood at every systole or Constriction propulses it into the right ventricle, thence it passes through the pulmonary artery into the lungs, which by their Continuall motion helpe to squeese it into the pul-

78 Except that it receives the hepate veins the postcaval vein has no connection with the blood vessels of the liver in the adult.

79 Straining.

80 This is Harvey.

monary veine by mediation whereof it arrives at the left auricle, which at every systole likewise ejects a proprotionable Quantity into the left ventricle, thence is the blood by a vigourous pulsation Cast into the aorta and so by the branches, surcles, and Capillaryes thereof diffused throughout all the Body.

Now the Branches of the Vena Cava and Aorta being scattered and disseminated through all the parts thereof (these being dispersed through the lowest, the other through the other 2 Regions and limbs of the Body) and Conjugated in like manner with the Aortall surcles and divisions. The Arteriall Blood by the uncessant pulsations of the Heart Contractions of the muscles, and Severall motions of the lungs is percribrated and Squeesed through the Porosityes of the flesh into the Capillary veines, which Being every where ready to receive it, doe returne it by Several Streames and rivuletts which at last meeting in one great channell (the trunk of the Cava) is at the mouth thereof by the Auricle disgorged into the Heart againe; And thus repeating the Course wee have just now delivered Continually Sayles in a Circulatory motion round about the body So that the ventricles of the Heart are as it were the 2 maine sluces or through Ports through each of which all the Blood Sallyes every Round it walkes about the Body.

Thus is the Heart the maine organ and Impulsive Cause of the Circulation the Arteryes and veines are the Circulatory vessells, wherein Nature (like an excellent chymist), thus Continually channells (or as they phrase it) Pellicanizes[81] the Blood that the Crude and inconcocted parts thereof might accquire a perfect elaboration the noxious and excrementitious parts avoidance and Separation, as wee shall shortly show in an excellent parallel twixt chymicall and naturall operations, and all the parts of the Body their respective nutriment heat and refocillation[82] for by these repeated Circulations, every part receives its appropriate and specificall nutriment for what one part refuses, another embraces, and by this perpetuall motion all particles in the Blood, are at sometime or other offered to all parts indifferently, and the whole fabrick thereby kept up by Continuall reparations.

Now the blood chanelling thus through all the parts and organs of the Body. It Cannot escape the Consideration of any man that it must necessaryly accomplish its revolution farre sooner through Some parts of the Body than others, according as they are nearer

81 Activates.
82 Reinvigoration.

or farther off the Heart. For the Blood chanelling in lesser Circles through the parts of the Middle Region (and because of their visinity to the heart,) must necessaryly performe many revolutions, before the Blood in the other 2 Regions and limbs of the Body, Can accomplish one: and thus respectively to the parts the Circulation is Concentricall, and wheeled about in greater or lesser Circles according to their distance and elongation from the Centre. Thus the first and speedyest Circulation is performed in the parenchyma of the Heart itselfe, for a portion of the blood being Continually propulsed by the left ventricle into the Coronall Artery and its branches dispers'd throughout the whole Body and Substance of the Heart, is returned by the Coronall veines through the Cava into the Heart againe, which the valve in the Coronall veine easyly demonstrates.[83]

Againe another Circulation which is swiftly performed is through the lungs. For the Blood being propuls'd through the Pneumonicall Artery into the Lungs, is by transcolation through their Spongious Body Squeesed into the Pneumonicall veine, and so into the Heart againe. So likewise a Portion of the Blood being propuls'd through the emulgent Arteryes into the Kidneys, is againe by the emulgent veines return'd into the Cava thene with the Maine Streame Carryed into the Heart againe.

So likewise the Blood being propuls'd through the left Caeliacall Artery into the Spleene is againe returned (Saving what is requisite for nutrition which is always to be understood) by the Ductus Splenicus into the Portall veine, and thence through the liver into the Cava, and there meeting with the whole Current of blood is Chanell'd to the Heart againe.

Whereas in all this Interim, the Blood in the Extremityes of the Body (having a far longer journey to take has not perchance accomplished one Revolution that it siles[84] not so quickly by farre through the stomach, gutts, other membranous and tendinous parts of the Body, as through the fleshy and musculous parts.

Againe which may much retarde or accelerate the Circulation is the Solidity, or porosity of the parts, for the Blood Cannot with the same Vehemency activity and Celerety passe through the Solid, dense and Compacted parts, as through the lax, fungous and spongy ones, and therefore 'tis rationall to believe, that it siles not so quickly through the substance of the Heart as through the

[83] The coronary veins do not open into the postcaval but directly into the right auricle. The valve mentioned by Power was doubtless the Thebesian valve.

[84] Glides, moves.

veines, and more swiftly through the liver than the heart or veines, through the Spleene than the Liver, and lastly with great ease and celerity through the Lungs than any other part of the body.

And from these Considerations it will follow that through at every Systole of the Heart there be ejected ℈i or ℈ii[85] and that there be 3 or 4000 pulses in 1 hower, that therefore the whole masse of Blood in the Body should be circulated in so short a time as ¼ Hower as Walaeus Conceives, or twice or thrice in 1 hower as Conringius supposes or every hower as Cornelius ab Hoogheland and De Roy will have it. For though there be according to these Suppositions 20, 30 or 40 lbs of Blood ejected out of the Heart into the Ateryes (which is more tha ncan possiblely be Conceived to be in the Body of a man (per *Exp*[erimentum] yet htence Can no sound Inference be deduced of the whole Masse circulation. For the Blood in the Middle and lowest Region [of the abdomen] performing many Circulations (as wee have declared) may yeild Constant Supplyes to the Heart, and so be Circulated againe and Againe, before that in the extremityes of the Body hath performed one Revolution. Yet for all this wee may probablely Conceive that the whole masse of Blood in the Body wheeles about 4 or 5 a day at the least if wee doe but consider *Exp*[erimentum], and thus they conceive the blood to make its returne through the flesh into the veines and so to the Heart againe.[86]

Now for the decision of this point wee shall rashly cast our assent to neither nor oblige our reader in the beliefe of any thing that is not consonant to autopsy and inspection of the synanastomoses or coniosculations of the veines and arteryes.

First therefore for anastomoses or rather synanatomoses,[87] though they have been generally embraced by all anatomists, and their existency not questiond by any one for this 2000 years since Galen their primary author, yet if wee appeale to experience and the infallible testimony of sense, wee shall see how dangerous a thing it is to prostitute our credulity to antiquity, and to swallow down their assertions as un-deniable truths without bringing them to the test of ocular experience.[88]

[85] One or two scruples.

[86] The figures in this paragraph are erroneous. Cf. Note 69.

[87] Power is here distinguishing between a cross connection of two vessels and direct continuity as in the case of the capillaries. The introduction of Galen's name is relevant only in the former of the two.

[88] Power's sceptical attitude towards the ancients does not affect his own belief that arteries and veins are *not* connected in the tissues by anastomoses [capillaries].

Exp[eriment 2.]

Boyle the liver, Spleen, lungs and Reines-kidney of any young Animal (because in them they are more tender and so fitter for the experiment) till their whole substance be so soft and friable, that it will moulder away and shake of[f] from the vessells, as a dusty sandy earth will doe from the fibers of a root, pluck'd out of the ground, so that All the divarications and capillations of the veines and arteryes may be very cleerely discernable. Then if there were any synanastomeses or incoalescency[89] of the Portall Branches with those of the Cava in the liver or of the veines and arteryes in any other part they would be easyly discoverable, yet wee have with much industry and exactnesse repeated this experiment, and could never discover the least sensible inosculation. Indeed sometimes the vessels would be united sometimes by a laterall adhaesion, or Contiguity one to another as that of the Splenicall veine with its Concomitant artery, immediately before they shoot into the spleene, likewise in the progresse of the Spermat veines and arteryes, so likewise in the Coition of the mammary with the epigastricall veines under the right muscle of the Abdomen. But never any insertion or inosculation that the tube or Cavity of the one open'd into the other as is observable in the Synanastomisis of the Embryo.

Exp[eriment] 3.

Againe take that excellent experiment of our noble Professour Dr. Glisson, which at once both proves the circulation of the blood and its transcribration through the parts of the Body:

Take (saith hee) a glyster Bagge mounted and fill it full with Hott water tinged with milk and thrust the glyster pipe into the vena Porta and tye it hard about that neither the pipe nor liquour Can slippe out; then withdraw the Cork and pressing the liquor with your hands (as in the Administration of a glyster) you shall see the water to run into all the branches of the Cava and from thence to passe into the right auricel and ventricle of the heart, nay further through the pulmonary Artery into the lungs also and so into the left ventricle and thence into the Aorta itselfe.

In which experiment if you Cutt into the liver you shall see all the blood and ruddinesse of it to be washed cleere away not only out of the veines and arteryes[90] therof but also out of the very

89 Non-coalescence.

90 Such an injection would not enter the hepatic arteries. Still less does it confute the existence of capillaries.

parenchyma of the Liver itselfe which then will look of a duskish yellow Colour, which does not only Confute all anastomoses in that organ of the vessells but also excellently shows the naturall streame and channell of the blood itself runing in. By the like Artifice you may percolate water (tinged into any Colour) through the spleene or kidneys, or by putting the syring or pipe into the Crurall artery you may see it passe through the muscles and habit of the legge itselfe into the branches of the Crurall veines so that it will wash away all the Blood cleere out of the flesh, in so much that if you prick any part of the legge with a pin, you shall [not] see any blood, but the discoloured liquour will appere.

Thus is there a Constant flux and reflux of this Red Sea of blood within us as well as in that without us;[91] Had Paracelsus known this mystery, hee might farre better have made out his Analogicall philosophy and his Crocosmicall[92] Conceits, then by those lank and farre fetch'd parallelismes which hee Sometimes uses.

Hen. Power 1652.

91 This cryptic passage presumably means that the circulation of the blood is not confined to external structures but dominates also internal parts.

92 Transcendental.

A Note on Rosso and the Illustrations to Charles Estienne's *De dissectione*

C. E. KELLETT*

IN a previous paper[1] we have dealt briefly with the conditions under which the *De dissectione* was produced and have shown how the figures in the gynaecological section are derived from Caraglio's engravings of the loves or transformations of the gods. These were prepared from a series of drawings by Perino del Vaga who, after the sack of Rome, completed eighteen of the twenty designs commissioned by Baviera, the remaining two having been done by Rosso. In the same paper it was suggested that the long series of male dissection figures were based on designs by the latter; but whereas it was found possible to demonstrate by direct comparison the relationship to Perino del Vaga's drawings, such a demonstration was not found possible in the case of the Rosso series.

In this paper I am submitting certain indirect evidence which does appear to support this attribution. This is based in part on the statements made by Vasari and Cellini, who knew Rosso personally, and in part derived from a consideration of the illustrations themselves and their relationship to book production in Paris and Estienne's activities at that time.

The plates under discussion are those on pages 149 to 253 in the Latin edition of 1545. They include on pages 154 and 155 the two earliest plates in the work, signed by Jollat and dated 1530 and 1531. These appear to be the work of another artist, far less competent and sophisticated, and are possibly by Jollat himself. They are inserted in rather an arbitrary fashion between the three elegant plates of the flayed man (on pages 149, 150, and 151) and the subsequent long series of dissection figures which tails off after a hundred pages or so in an ill-assorted group of miscellaneous plates, with which this paper is not immediately concerned.

As they progress, the character of the drawings changes. To begin with, they follow a familiar enough pattern, so closely related to Berengario's plates that the artist who drew them may well have

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1 Kellett, C. E. Perino del Vaga et les illustrations pour l'anatomie d'Estienne. *Aesculape*, 1955, *37*, 74-89.

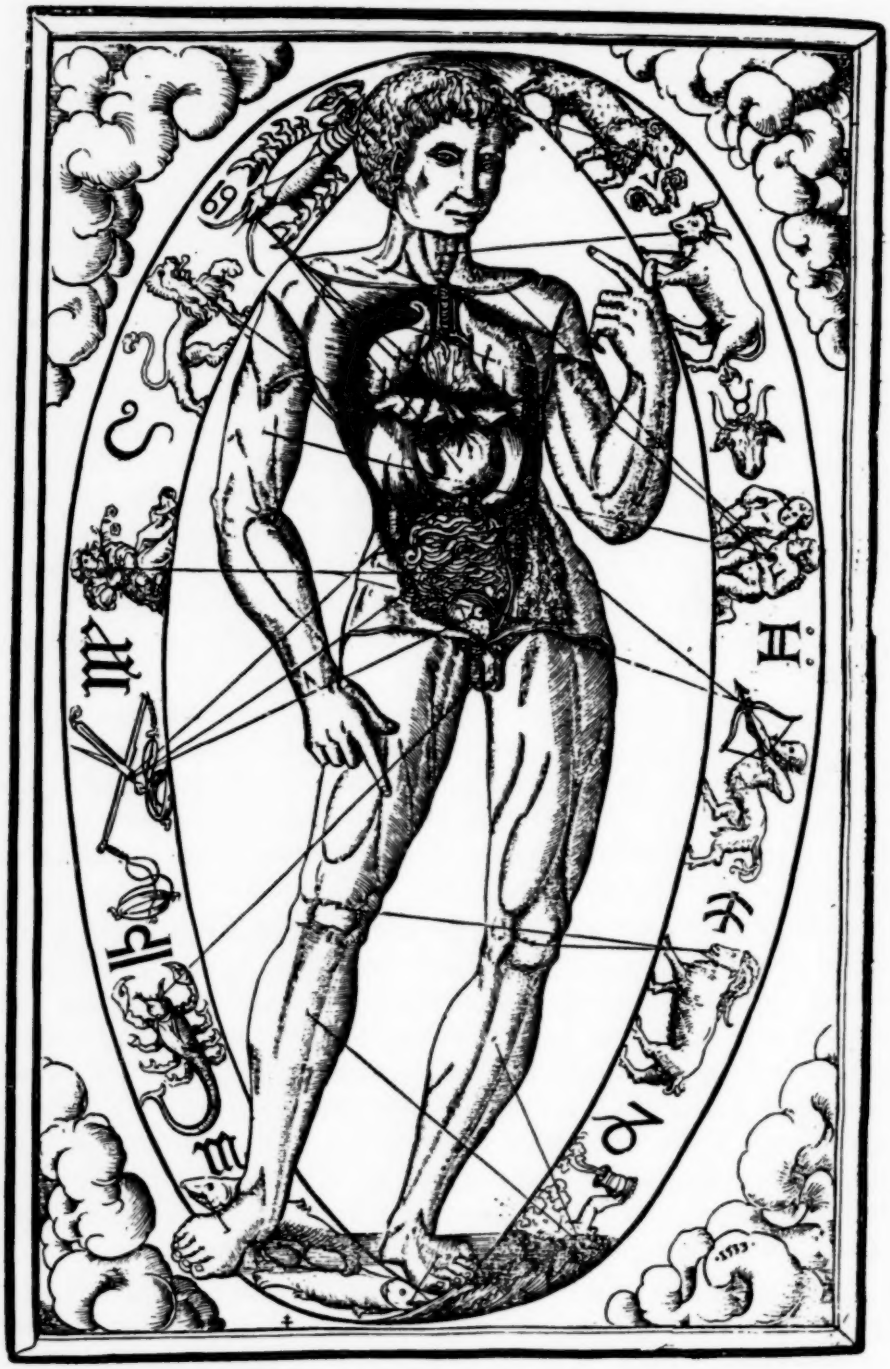

FIG. 1. Jollat's Zodiac plate with cross of Lorraine, dated 1533. In *Les figures et portraicts des parties du corps humain,* Paris, J. Kerver, 1557, sig. A1*b*.

had this book by his side. They exhibit, nevertheless, a very personal point of view. There are young men who display the anatomy of their abdominal wall, just as there are in Berengario's; but whereas the latter are delightfully carefree and unconcerned, the former (pages 161, 163, 165, 166, and 170) are portrayed as elegant, petulant, and resentful. At this point the Berengarian series, interrupted on page 168, stops. These young men are now depicted hooked up on trees and propped up against crumbling masonry. Despite the care with which they are arranged, it is abundantly clear that they are dead. They have none of the fictitious stereotyped life of the Vesalian muscle men and they have no forerunners, unless it be amongst the mediaeval representations of the quick and the dead; and no successors. They are not ordinary anatomical studies but rather pictures of the partially disembowelled dead, and as the series reaches its end they are shown leaning against shrines and sprawling in great chairs. These morbid and remarkable drawings were made, then, some time after 1521 (when Berengario's Commentary on Mondino first appeared) and were completed by 1530, when the first plates of the *De dissectione* were being engraved. They are the work of a man who must not only have been a great artist but, at times, barely sane.

In October 1530 Rosso came to the Court of France. He was 35 years of age: of imposing presence and delightful manners, a skilled musician as well as painter, and learned in philosophy—the troubled Neoplatonism then in vogue in Florence—and mythology. He was the child of his time and the personification of Ficinus' new concept[2] of the artist as the child of Saturn—Saturn, the leaden, unstable planet pictured as devouring his own greatly gifted children, rather than, as in the pictures of Baccio Baldini, of bright Mercury, born of Heaven and Day, and brother of Venus.

Both Vasari and Cellini must have been conscious of the strange change that would take place in Rosso's personality. From them we learn how, in his case, months of intensive creative effort were followed by prolonged periods of profound depression, in which one who had been the best and most sociable of companions became surly and obsessed with groundless suspicions. When he came to France he was about to enter upon his final and most brilliant creative phase, followed once again by a period of intense depression, which on this occasion ended with his death. He had lost all his belongings in the sack of Rome in 1527 and brought

2 Chastel, André. *Marsile Ficin et L'Art*. Geneva, *E. Droz*, 1954.

FIG. 2. From Estienne's *La dissection des parties du corps humain,* Paris, 1546, p. 181.

little with him, apart from his genius and a book of anatomical designs, which he intended to have printed in Paris. He had always shown a rather disconcerting love of the bizarre and macabre; one of his earliest sketches is of a series of elderly and dying people crowded around a skeleton, and his picture of Madness engraved by Caraglio dates from the Roman period. This book of anatomical designs appears also to have come into being in rather unusual circumstances, for we learn that when he was staying with the Bishop Tornabuone in his palace at Borgo, after his escape from Rome, he "disinterred dead bodies from the burial ground of the Episcopal Palace, in which he had his abode, and made very fine anatomical studies." These were not dissections but are almost certainly the studies on which many of the figures in Estienne's book are based. These, indeed, could scarcely have been created in any other way. Rosso was not an anatomist but since 1518 had been a Member of the Painter's Guild at Florence and had therefore had access to the public anatomies regularly carried out by the Faculty there. Furthermore, while he was at the height of his popularity in Rome, Berengario da Carpi, a great lover of the fine arts, was also enjoying there a great success. Both were very friendly with Cellini and probably met. It is unlikely that Rosso knew more Latin than his great predecessor, Leonardo da Vinci, so that the sole textbook of anatomy available to him would be that of Mondino, which had been available in Italian since 1493. On the other hand, if he knew Berengario, it is almost certain that he would have seen his version of Mondino's text which he had published shortly before his journey to Rome, embellished by a very long, at times bawdy and occasionally entertaining, commentary and certain tentative illustrations. The latter enjoyed a great success and were copied both in France and Germany, but are incomplete and obviously capable of considerable expansion. This is what we believe Rosso had in mind, for neither he, nor for that matter Vesalius, could have foreseen the time when there would be a better market for the illustrations than for the text they were supposed to illustrate.

Kusenberg, who has devoted much time to the consideration of the drawings of Rosso that have survived, points out that his drawings of the nude are either from life or else imagined, and the former, he says, are unbelievably clumsy, for Rosso is incapable of mastering reality which he can grasp only as a result of indirect

intuition.[3] We may, therefore, safely assume that the designs he brought with him are based only on the sketches he made at Borgo; and since he can scarcely have failed to have been fascinated by the Zodiac Man shown in the majority of early editions of Ketham, in which Mondino's anatomy was commonly found, it is reasonable to suppose that amongst the designs were some dealing with this particular aspect so dear to the Florentines of that period, of the relation of man, the Microcosmos, to the Macrocosmos. Indeed, had he for a moment paused to consider his own career, he must have thought of it as part of a cosmic pattern, quite beyond his control and, with the wisest of his contemporaries, felt that the clue to his behaviour lay not in himself but in the stars, whose influence and pervading care is so graphically described by his contemporary, Leone Ebreo.

Such a book of designs would have been almost certainly handed over to Tory, the King's Printer, or his close associate, Colines, in order to have the blocks prepared and the lay-out of the book decided on; and throughout, where these plates are signed, they bear the Lorraine Cross, commonly associated, since Bernard's monograph, with Tory's workshop. Some of the blocks bear Jollat's sign or signature in addition, and he was probably responsible for the preparation of all of them.

One of the female figures, that on page 260, was taken from a design that Rosso had prepared for a series on the Lives of the Gods, commissioned by Baviera. He had done but two of these, the remainder being executed by Perino del Vaga from whom, as we have seen, he borrowed the remaining figures required for his illustrations. The two ugly diagrammatic muscle men on pages 103 and 116 appear at first sight to have little in common with the plates already mentioned but are actually constructed from the lovely plates on pages 149 and 151, their outlines being reproduced in mirror fashion.

We are told by Noel de Fail that even Sylvius made use of diagrams in his lectures, and some such diagram seems to have been used to complete these plates. Yet another was adapted to make one of the best known of these diagrammatic figures. This, the

[3] Kusenberg, K. *Le Rosso.* Paris, Albin Michel, 1931, 230 pp. (p. 135). "Vasari rapporte que le Rosso laissait rarement s'écouler plusieurs jours sans dessiner de modèles nus. Les dessins de nus qui ont été conservés sont ou exécutés d'après nature ou de chic. Les premiers sont d'une maladresse étonnante, et tout au plus froids et académiques. . . . Le Rosso est incapable de dominer la réalité, qu'il ne peut du reste saisir par intuition directe. C'est dans les nus de chic, récréés et généralisés par le travail de l'esprit qu'il réussit le mieux."

A fin que vous ne
ble doubteux ou ambi-
gu en ce pourtraict/ vo-
uluds que le foye n'eſt
en ſa ſituatiõ naturelle:
mais eſt vñuerſé & re-
tourné vng peu a coſté/
pour plus facile demõ-
ſtration des pores ou
conduictz de l'humeur
colerique/ enuoyé de la
meſſye du fiel au ven-
tricule / ou orphyſe /
qu'auons cy deſſus nõ-
mé douzain.

FIG. 3. From Estienne's *La dissection,* 1546, p. 185.

vascular man, on page 134, whose outline is taken from the figure on page 161, was not only copied at the time but has recently been extensively used in an advertisement of a hypotensive drug. The diagram which it incorporates was presumably in current use. The Vesalian drawings of the arterial and venous systems in the *Tabulae sex* may have been based on it and, as is well known, they in turn were adapted by Ryff to a partially seated figure, while the Estienne figure was copied by Dryander.

At that time, too, the skeleton men on pages 13 and 15 and the remarkable ligament and nerve men on pages 43, 44, 59, and 63, were presumably drawn and engraved, and since one of them, as is well known, bears hanging from a shrub in the corner the initials S.R., it is possible that the preparations from which the drawings were made were actually by Estienne Riviere, who at that time was beginning his training as a Barber Surgeon. Some six years later he was on the friendliest terms with Charles Estienne, who seems nevertheless to have been very much the senior, and it is probable that he too had a hand in this book, since Colines was his step-father and he was at that time learning from him the trade of a printer. He was then twenty-six years of age and a very competent young man. During this time he may well, as Lau[4] suggested, have visited Italy but one wonders if he really spent so long a time there as Lau suggests. Scattered throughout his early books are brief references to things seen in various Italian cities and to certain distinguished names such as those of Bonamico at Padua and Frizimelega. They enliven his skilful little compilations and give one the impression that their author had travelled to the proper places and met the right people, and this may well have been their intention. He was a young man who still had his way to make and uncertain of the career he should adopt. This suggestion as to the rôle played by Estienne is rendered the more likely since we next find him undertaking an identical editorial task for Lazare de Baif who had come back from the Venetian Embassy in March 1534 and was proposing a new edition of his antiquarian works. These were to be illustrated with a series of drawings of Roman remains he had secured through the agency of the French Ambassador in Rome, Francis de Dinteville. Some of the blocks prepared from the drawings bear again the Cross of Lorraine, and once more it seems probable that they were cut, as were those of Rosso's Anatomy, in

[4] Lau, E. *Charles Estienne (Biographie und Bibliographie)*. Inaugural-Disseration. Leipzig, 1930.

A iij

FIG. 4. From the 1575 edition of Jollat's *Les figures.*

Tory's workshop; but in this instance the book was not only brought to a successful conclusion and published in 1536 by Robert Estienne, his brother, but it carries an explanatory preface signed by Charles Estienne, from which we may deduce the part he had played.

In 1532 Lotrian and Janot published in quarto a French translation of the Anatomy of Mondino, illustrated with new versions of the Berengarian plates. This book not only forestalled that which Tory and Colines were preparing for Rosso but was protected by the King's Privilege for a period of three years, and this is presumably why Rosso's book was put to one side until this should have lapsed.

During the next few years Estienne was a member of the de Baif household and his thoughts were, as his publications show, more on agriculture than on anatomy. Much of his time was, moreover, occupied not only as tutor to Lazare's little son, Antoine, but also in rewriting as school texts certain of his employer's own works. Rosso, too, can have no longer been interested in the little book. He was indeed fully occupied at Fontainebleau with the decorations of the Palace, where a large team of Italian and French artists were engaged in carrying out his designs.

In 1538, however, Estienne decided to become a physician. This decision, which was the occasion for a flattering little poem by his friend, Sussanneau, may have had an ulterior motive, possibly shared by Riviere, for in the following year Estienne married Genevieve de Verley, the daughter of Gilles de Verley, Surgeon to the King and at the head of his profession, while the project on which he and Riviere had been engaged together for the past few months ended in a notorious squabble. This project I hope to discuss in detail another time, but it would seem to have involved writing a new book of anatomy, using the discarded yet valuable blocks in his stepfather Colines' house. Some were used as they were—the skeletons and various diagrammatic figures—many were modified by means of an inset—the customary way of correcting a block—and some discarded.

Estienne in 1538 was not qualified and therefore far from being, as Malgaigne puts it, one of the cleverest professors of the Faculty; but shortly after his marriage (and here one feels the influence of his father-in-law may well have been helpful) he was able to remedy this. On 20 February 1540 the Faculty passed a

special grace[5] enabling him to sit the examination for the Baccalaureate, his studies during the previous four years, though unregistered, being accepted in lieu of the normal four-year course. On 17 April, moreover, they passed a special grace enabling him to take this degree, though he was already married.

In the meantime, pending a settlement in the court, the Anatomy remained incomplete. The nature of the revision that had been undertaken is clearly shown if a comparison be made between the abdominal viscera depicted in the new insets with that shown in the discarded plates. For three of these, at any rate—the lovely zodiac and planet figures—were retrieved by Kerver when the blocks came into his possession and were published, together with the other plates, in his edition in 1557. They show no signs of having been "corrected" and from them we can form some idea of the original anatomy Rosso had planned.

There is a world of difference between the abdominal viscera as shown in the insets in the plates on pages 172, 175, and 180, and those of the planet and zodiac man. The former lie close to reality and indeed compare, if perhaps unfavourably, with the similar illustrations in Vesalius; the latter belong to a world of their own, that of Mondino's verbal description[6] grasped as a result of his intuition. The colon is barely visible, but

> The place of the stomach is in the middle of the body between upper and lower, between right and left, and between anterior and posterior. . . . The stomach is rounded, since this shape is less liable to injury and because, of all shapes, the round is most capacious, for the stomach hath much to hold. . . . [It] hath heart above, being separated therefrom by the diaphragm, and mesentery and intestines below; to the right it hath liver by the five lobes of which it is clasped as by a hand with five fingers, to the left it hath spleen, by the arteries of which it is warmed. . . .

Here are symmetries of which the body knows nothing. This should not, however, surprise us. This Anatomy should not be judged by Vesalian standards. The Mannierist painter was content

[5] *Commentaires de la Faculté de Médecine de Paris.* Tome V (1532-1544).
Fol. 137. Februarii 20 (1540) Probatio temporis baccalaureandorum . . .
2. Carolus Stephanus, diocesis Parisiensis, Probavit quatuor annos 4 schedulis non registratis, finitos in festo omnium Sanctorum anni 1539.
Fol. 138. 17 mensis superioris (Avril 1540) coacta est Facultas ad audiendam relationem dominorum examinatorum, ubi admissi fuere novi baccalaurei ad juramenta, quae prestiterunt omnes nisi quod Carolus Stephanus (qui uxoratus erat) in statum de non uxorais noluit pejerare, quapropter dispensatum est cum illo (ut aiunt) a Facultate et illi indulsit totum collegium ut cum coeteris admitteretur ad specimen faciendum in scholis (quod vocant principium).

[6] *The fasciculo di medicina, Venice, 1493.* With an Introduction, etc., by Charles Singer. Florence, R. Lier & Co., 1925. Part 1. Translation of the "Anathomia" of Mondino da Luzzi, p. 68.

to let the Flemish paint with a view to external exactness; his concern was not so much with the appearance of things as in the eternal verities he assumed lay concealed within them. "For good painting," Hollanda[7] reports Michel Angelo as saying, "is nothing but a copy of the perfections of God and a recollection of His painting; it is a music and a melody which only intellect can understand, and that with great difficulty."

ACKNOWLEDGMENTS

It is a pleasure to have this opportunity of thanking the Librarian of the Faculté de Médecine for facilities so readily given me and, in particular, Mademoiselle Paule Dumaitre, for finding these references to Estienne in the Commentaires.

7 Hollanda, Francisco de. *Four dialogues on painting.* London, Oxford University Press, 1928, p. 16.

Tobias Smollett (1721-1771)—The Doctor as Man of Letters*

CLAUDE E. JONES**

THROUGHOUT its long history, literature has been much indebted to medicine and surgery and to their practitioners. In early ages, when healing and religion were more closely identified than they are at present, the distinction between prophet and doctor was undoubtedly difficult to draw, and the man of medicine appears in many cultures also as a man of religion. Notable examples of the latter are Saint Luke and Maimonides; and the effects of the writings of the former on the literature of Christian Europe since classical times would, for example, be impossible to estimate. Furthermore, the medical theory of the humors provided elements of character conception and treatment for writers in drama and other fiction from classical times down to the nineteenth century and was only superseded in importance by the relatively modern concepts of medically based psychology as that science became popularized and thus available to lay authors.

Also vital to the development of imaginative literature have been the contributions of authors with medical training, interests, and experience. Notable among these are Rabelais and Thomas Lodge in the Renaissance; Goldsmith and Smollett in the Neoclassical period, and—more recently—Keats, Conan Doyle, and our own contemporary and fellow-countryman, William Carlos Williams. Besides these, there has been in every age a whole galaxy of lesser figures, particularly in eighteenth century England, when many professional men—lawyers and ministers as well as doctors—increased their social standing and supplemented their incomes by literary work. It is not surprising to find physicians among these writers, because of their wide acquaintance with mankind. In fact, the physician as novelist brings unique knowledge to the treatment of character and setting, as we shall see. And in no other medically trained novelist has such knowledge combined so thoroughly with the professional point of view as in Tobias George Smollett.

* This paper was delivered before The Society for the History of Medical Science, Los Angeles, on 16 February 1956.

** Los Angeles, California.

I think our best approach to him is first biographical, then analytical—with particular attention to the medical features of his work.[1]

Smollett, who had been born in March 1721, was apparently attending some medical and anatomical lectures at the University at Glasgow and working in a dispensary there by late 1735. In 1736 he was apprenticed to William Sterling and John Gordon, well-known surgeons of that city, but in 1739 they released him from his five-year "articles" because of poor health.

He went to London, probably taking with him his ill-fated tragedy, *The Regicide,* and perhaps (like Roderick Random) copies of Horace and of Wiseman's *Surgery.* By this time he had learned much practical surgery, was familiar with standard apothecary procedures, knew something of the practice of physic and anatomy, and, according to his friend and first biographer, Dr. John Moore, understood Greek and mathematics and "took much delight in the *Belles Lettres* and poetry." Records of his first brief residence in London are scanty, though he probably carried there letters of introduction to Dr. James Douglas, well known for his venereal cure, and to his brother, the surgeon John Douglas.

On 10 March 1740, he received his warrant from the Navy Board as surgeon's second mate of a third rate. Undoubtedly his experience with the examiners at Surgeon's Hall (the location, by the way, of Hogarth's anatomical dissection plate, fourth in the *Stages of Cruelty* series) closely paralleled the account in Chapter 17 of *Roderick Random.* (Oliver Goldsmith failed this examination some twenty years after Smollett passed.[2])

Most of Smollett's service in the royal Navy was aboard *H.M.S. Chichester,* of 80 guns, which he joined on 3 April 1740. Probably the following description of the sickbay aboard the *Thunder* in *Roderick Random* is also based on personal experience:

> . . . about fifty miserable distempered wretches, suspended in rows, so huddled one upon another, that not more than fourteen inches space was allotted for each with his bed and bedding; and deprived of the light of the day, as well as of fresh air; breathing nothing but a noisome atmosphere of the morbid steams exhaling from their own excrements and diseased bodies,

[1] Sources of information about him and this phase of his writing are many, besides Smollett's letters and his other published works. Notable among these are Dr. E. Ashworth Underwood's most illuminating article, "Medicine and science in the writings of Smollett" (called to my attention by Miss Louise Darling, Bio-medical Library, UCLA), Mr. W. D. Taylor's informative note in the *Aberdeen University Review* in 1939, and Professor Lewis Knapp's excellent full-length biography, *Tobias Smollett, Doctor of Men and Manners,* published by the Princeton University Press in 1949.

[2] Anon. Dr. Oliver Goldsmith. *N. Y. med. J.,* 1920, *112,* 727-8.

devoured with vermin hatched in the filth that surrounded them, and destitute of every convenience necessary for people in that helpless condition. (Ch. 26) [3]

We are also left wondering if the harrowing muster of the "sick, lame and lazy" in chapters 27 and 28 of the same novel is an eyewitness account, as well.

In the *Chichester* he sailed with the fleet in late October, arriving at Port Royal, Jamaica, on 10 January 1741, after a stormy passage in which two of his shipmates were lost over the side, a fact which he used in *Random*. Smollett's duties during the disastrous attack on Cartagena are not a matter of record, although there is reason to believe that at least part of the time he was on detached duty with the ground troops. The situation of wounded soldiers aboard the "hospital ships" is described as follows in his Cartagena account for the *Collection of Voyages* which he published in 1756:

As for the sick and wounded, they were next day sent on board of the transports and vessels called hospital-ships, where they languished in want of any necessary comfort and accommodation. They were destitute of surgeons, nurses, cooks, and the proper provision; they were pent up between decks in small vessels, where they had not room to sit upright; they wallowed in filth; myriads of maggots were hatched in the putrefaction of their sores, which had no other dressing than that of being washed by themselves with their own allowance of brandy; and nothing was heard but groans, lamentations, and the language of despair invoking death to deliver them from their miseries . . . Every ship of war in the fleet could have spared a couple of surgeons for their relief; and many young gentlemen of that profession solicited their captains in vain for leave to go and administer help to the sick and wounded.[4]

This permission was denied because of the jealousy existing between the admiral and the general commanding. That the taste of his naval experiences was long-lasting is obvious from his comments in a review[5] in 1758 concerning Admiral Knowles, one of the commanders at Cartagena, a review which, incidentally, sent Smollett to prison in 1760. The *Chichester* returned to England in 1742, but Smollett arranged to have his pay turned over to an

[3] This quotation, as well as some of those which follow, also appear in my edition of Smollett's *Essay on the external use of water*, in *Bull. Hist. Med.*, 1935, *3*, 31-82. This edition was also published in book form by The Johns Hopkins Press, Baltimore, 1935.

[4] Smollett's "Account of the expedition against Carthagena" appears in Volume 5 of the *Compendium of authentic and entertaining voyages* (London, 1756), pp. 313-342. For discussions of Smollett's naval service, particularly in the Carthagena campaign, see: Lewis Knapp, Naval scenes in *Roderick Random*, in *Pub. mod. Lang. Ass.*, 1934, *49*, 593-7; Section I, "Smollett and the navy," in my *Smollett studies*, published by the University of California Press, 1942; and Chapter 2 of Knapp's *Tobias Smollett* (see note 1).

[5] Smollett wrote this article on *The conduct of Admiral Knowles* . . . for *The Critical Review*, where it appeared in May 1758. This article comprises Appendix A in my *Smollett studies*, mentioned above.

attorney, James Henshaw, probably because he himself was still in Jamaica. At any rate, we lose track of him during 1742 and 1743, and legend has it that "he quitted the service in the West Indies, and resided some time in the island of Jamaica." Certain it is that, during this period, he wooed and won a Jamaica heiress, Ann Lassells.

He next appears in London in May 1744, practising surgery and with a fashionable address in Downing Street. Apparently he did not prosper, however, for he left there in March 1745 and by January 1746 was residing in Chapel Street (near Berkeley Square) where he continued until January 1748 at a rent of £8, instead of the £26 he had paid earlier. From 1746 on, Smollett was practising literature as well as medicine, and in 1748, with the success of his first novel, *Roderick Random*, he seems to have settled on literature as a career. Even so, he apparently retained an interest in medical practice and in 1750, as Mr. Taylor puts it, "He evidently felt that he would be the better of a degree, so he sent a fee of £28 Scots and certificates from two sponsors to Marischal College, Aberdeen, and received a diploma creating him Doctor of Medicine. . . ."[6] The names of his sponsors are not recorded, but, according to Mr. Taylor, "They could have included Drs. Smellie, William or John Hunter, William Armstrong, or James Douglas, whose certificates were regarded as equivalent to those of the Universities and Medical Incorporations." Smollett was thereafter most proud of his medical degree and used it on the title-pages of all his acknowledged work. (It must be borne in mind that few of the practising physicians and almost none of the surgeons were doctors of medicine.) His biographers have always assumed that he practised medicine at Bath in the summers, but his *Essay* shows an unwonted modesty about his own personal experience there, and it seems more probable that his frequent visits as patient, rather than experience as Bath doctor, account for his extensive knowledge of that spa.

Although his literary accomplishments as such do not concern us here, some insight into the man's phenomenal industry and breadth of interests may be gained from a brief review of his production during the last two decades of his life. *Roderick Random* was followed, in 1749, with his tragedy, *The Regicide*, as well as an excellent translation of Le Sage's *Gil Blas* (the prototype of *Random*). During the 1750's he published two novels (*Pickle* and

[6] Taylor, W. D., Tobias Smollett, M.D., Aberdeen. *Aberdeen Univ. Rev.*, 1939, *26*, 125-35.

Fathom); edited a book of travels and Smellie's *Midwifery* (to which he contributed); translated Le Sage's *Asmodeus,* a Voltaire novelette, and *Don Quixote* (on which his *Launcelot Greaves* was based); published his medical essay, a farce, and his *History of England* (in four volumes); compiled and wrote part of a seven-volume compendium of *Voyages;* helped to found, edited, and wrote much of the first eight volumes of *The Critical Review,* and commenced editorial supervision and partial composition of *The Modern Part of a Universal History,* which was completed in 44 volumes in 1766. In the next decade he continued (at least until 1763) the *Critical Review,* wrote a pro-Administrative party organ, *The Briton,* in 1762 and 1763, originated, edited, and wrote much (including *Greaves,* the first full-length novel initially published in magazine installments) for *The British Magazine,* published the five-volume continuation of his *History of England,* his two-volume *Travels,* and an eight-volume work, *The Present State of All Nations,* and supervised a 38-volume translation of Voltaire. During all this time (1760-70) he was sick, and he spent at least two years traveling in search of health. By 1770 he had settled down to die in Leghorn, Italy, but it was during this, the last full year of his life, that he finished one of the most humorous novels in the English language, the peripatetic *Expedition of Humphrey Clinker.* In much of his writing medicine plays a considerable part, and I am under the necessity to abridge, rather than enlarge, even the most notable examples of these materials.

First, then, to summarize his contributions to the literature of medicine (as distinguished from the medicine of literature). His principal publications are, of course, his edition of Smellie's *Midwifery* in 1751 and his *Essay on the External Use of Water* in the following year. It must be borne in mind that both were at the time of their publication controversial: the position of "Men-midwives" was still somewhat tenuous in 1751, and the *Essay* was written to support Archibald Cleland, a surgeon, in his attacks on the vested medical interests of Bath.

Not so well known are the reviews dealing with medical works and written, or at least edited, by Smollett. The first of these appears in the *Monthly Review* for December 1751 and is a criticism of Smellie's *Midwifery.* Not only did Smollett "puff" the work which he himself had edited, but he also enlisted subscriptions for a set of illustrative anatomical plates to be published soon after. In July of 1752 Smollett also wrote for the *Monthly* a review of

John Pringle's *Observations on the Diseases of the Army in Camp and Garrison.*

Just which medical reviews appearing in the *Critical* from 1756 to 1770 were from Smollett's pen we cannot tell, but the journal contained a large number of them, including during the first year alone those on Thomas Neale's *Practical Treatise on the Venereal Disease and the Art of Bleeding,* C. Lucas's *Essay on the Waters, The Philosophical Transactions for 1755* (including several medical essays), Richard Manningham's *Latin Medical Aphorisms* concerning Midwifery, and James Grieve's translation of Celsus. Smollett's *British Magazine,* though devoted almost entirely to literary and anecdotal material, also contains, in 1760, "Remarks on the Practice of Drinking Mineral Waters," and an illustrated article on aneurism by George Armand, Surgeon. In 1762 we find an article signed "T.S." on venereal disease, and in this year and the next an illustrated article on the extraction of teeth. In 1765 appears "On the Impropriety of Employing Men Midwives," undoubtedly accepted for publication while Smollett was abroad.

Finally, there are two interesting comments on current English medical affairs in (i) his *History* (1765) and (ii) the *Present State of All Nations* (1768). In the former he writes, under the general achievements in the reign of George II:

> Though few discoveries of importance were made in medicine, yet that art was well understood in all its different branches, and many of its professors distinguished themselves in other provinces of literature. Besides the medical essays of London and Edinburgh, the physician's library was enriched with many useful modern productions; with the works of the classical Freind, the elegant Mead, the accurate Huxham, and the philosophical Pringle. The art of midwifery was elucidated by science, reduced to fixed principles, and almost wholly consigned into the hands of men practitioners. The researches of anatomy were prosecuted to some curious discoveries, by the ingenuity and dexterity of a Hunter and a Monro. The numerous hospitals in London contributed to the improvement of surgery, which was brought to perfection under the auspices of a Cheselden and a Sharpe.[7]

Three years later, in the *Present State of All Nations,* he summarizes as follows:

> Medical knowledge flourishes in England, as much as in any other part of Europe. Sydenham, Freind, and Mead, will always be remembered among the best writers in physic. The physicians, exclusive of their own province, are well tinctured with other arts and sciences, in consequence of an extensive and liberal academic education. Many of this class have distinguished themselves in the world of taste and polite literature. They are generally well bred, though formal in appearance, compassionate, generous, and hu-

[7] New edition. Vol. 5 (London, 1822), p. 406.

mane. Being easy in circumstances, they live like men of fashion, are always considered as gentlemen, and every where respected on account of their profession. The other branches of medicine are likewise cultivated in the most reputable manner. The professors of surgery and pharmacy acquire plentiful fortunes, maintain equipages and villas, keep a respectable place in the ranks of life, and are admitted into the best company.[8]

Turning at long last from Smollett's nonfictional treatments of medicine to those which appear in the novels themselves, I must begin with several general remarks, to be followed by a few specific examples. The medical elements in the novels comprise: first, comments on contemporary practitioners, beliefs, and practices; second, fictional characters who are apothecaries, surgeons, or physicians; and third, images or other figures of speech based on Smollett's medical training and experience.

I have already dealt at some length in my edition of Smollett's *Essay on the External Use of Water*[9] with his comments on actual "members of the faculty," as well as with his own creations among medical practitioners. The most detailed picture in eighteenth century English fiction of the expedients resorted to by London physicians to "drum up" practice appears in Chapter 52 of *Ferdinand, Count Fathom,* and should be read *in extenso* for its amazing modernity. Smollett's handling of specific ills and their cures, as well as his interest in, and knowledge of, medicine and related fields, are well covered in the *Proceedings of the Royal Society of Medicine*[10] by Dr. E. Ashworth Underwood.

Less familiar, however, are Smollett's uses of his medical training and experiences for purposes of setting, image, and mood. For example, only a doctor would be apt to write (in *Peregrine Pickle,* Chapter 42) of "a young man, in whose air and countenance appeared all the uncouth gravity and supercilious self-conceit of a physician piping hot from his studies." Or (in *Humphrey Clinker,* M. Bramble letter dated 29 May) have a character liken London to "an overgrown monster; which, like a dropsical head, will in time leave the body and extremities without nourishment and support."

And probably the best source for this type of material is Smollett's last, and by far his most enjoyable, work, *The Expedition of Humphrey Clinker,* published in 1771, the year of his death. This is an epistolary novel comprising letters written by five members of

[8] Vol. 2, p. 224.
[9] Cf. pp. 37-48.
[10] Underwood, E. A. Medicine and science in the writings of Smollett. *Proc. roy. Soc. Med., Sect. Hist. Med.,* 1937, *30,* 961-74.

a family who are traveling in England and Scotland from 2 April to 20 November, in the year 17??. The writers include Matthew Bramble, an irascible but lovable (and memorable) Welsh country squire who is constantly in search of health, his unmarried, grotesque middle-aged sister significantly named Tabitha, their teen-aged niece Lydia and her Oxford-undergraduate brother, Jerry, and that notable Mistress Malaprop of ludicrous orthography, Tabby's maid, Winifred Jenkins. This gallery of principals, differentiated by style as well as by personality, is reinforced by a galaxy of minor characters—many of them amusing "originals." Smollett himself appears, at length, as "Dr S—"[11] and forms the basis of the main character, Matthew Bramble.

Some notion of the method of the novel is afforded by the following excerpt from Jerry's letter dated at Bath on 30 April. Mr. Quin is the famous midcentury London actor, James Quin, whom Smollett had attacked earlier (especially in Chapter 94 of *Peregrine Pickle*), but of whom he wrote most enthusiastically in his later works. Jerry has been discussing his Aunt Tabitha, and continues:

I have much to say of this amiable kinswoman; but she has not been properly introduced to your acquaintance. She is remarkably civil to Mr. Quin; of whose sarcastic humor she seems to stand in awe; but her caution is no match for her impertinence. "Mr. Gwynn," said she, the other day, "I was once vastly entertained with your playing the Ghost of Gimlet at Drury Lane, when you rose up through the stage, with a white face and red eyes, and spoke of *quails upon the frightful porcofine*. Do, pray, spout a little the Ghost of Gimlet."—"Madam," said Quin, with a glance of ineffable disdain, "the Ghost of Gimlet is laid, never to rise again." Insensible of this check, she proceeded, "Well, to be sure, you looked and talked so like a real ghost; and then the cock crowed so natural, I wonder how you could teach him to crow so exact, in the very nick of time; but I suppose he's game. An't he game, Mr. Gwynn?"—"Dunghill, madam."—"Well, dunghill, or not dunghill, he has got such a clear counter-tenor, that I wish I had such another at Brambleton Hall, to wake the maids of a morning. Do you know where I could find one of his brood?"—"Probably in the work-house of St. Gile's parish, madam; but I protest I know not his particular mew." My uncle, frying with vexation, cried, "Good God, sister, how you talk! I have told you twenty times, that this gentleman's name is not Gwynn." "Hoity, toity, brother mine," she replied, "no offense, I hope; Gwynn is an honorable name, of true old British extraction. I thought the gentleman had been come of Mrs. Helen Gwynn, who was of his own profession; and if so be that were the case, he might be of King Charles's breed, and have royal blood in his veins."—"No, madam," answered Quin, with great solemnity, "my mother was not a whore of such distinction."

[11] See especially the long description of Smollett and his stable of hack writers in Jerry Mitford's letter of June 10. For detailed discussions of Smollett as Bramble, see Knapp's *Tobias Smollett* (Chapter 14), and Louis L. Martz, *The later career of Tobias Smollett*, Yale Univ. Press, 1942, Chapters 4ff. of Part II.

Matthew Bramble, the hypochondriac and apparent misanthrope, pursues his search for health to most of the spas (hotwells and cold-bathing establishments alike) of Britain. Although he finds (like Smollett in *The Travels)* that sea-bathing in cold water affords him the most effective relief, his memorable medical portraits and comments belong to Bath. Smollett does not, however, record such a case as his own apparently was, where a medically trained man submitted to a water cure at Bath. That this was a rarity appears from Christopher Anstey's amusing and extremely popular poem, the *New Bath Guide,* published in 1766. Anstey makes the following comment:

> But, what is surprizing, no mortal e'er viewed
> Any one of the Physical Gentlemen stew'd;
> Since the day that King *Bladud* first found out these Bogs
> And thought them so good for himself and his Hogs,
> Not one of the Faculty ever has try'd
> These excellent Waters to cure his own Hide;
> Tho many a skilful and learned Physician
> With Candour, good Sense and profound Erudition,
> Obliges the World with the Fruits of his Brain,
> Their Nature and hidden Effects to explain.[12]

To demonstrate Smollett's method of "rounding out" his subject, I quote both the 55-year-old Bramble and his 17-year-old niece concerning Bath. Bramble, on April 28, writes to his physician, a Welshman, as follows:

To Dr. Lewis.

Dear Dick:

I have done with the waters; therefore your advice comes a day too late. I grant that physic is no mystery of your making. I know it is a mystery in its own nature; and, like other mysteries, requires a strong gulp of faith to make it go down. Two days ago, I went into the King's bath, by the advice of our friend Ch——, in order to clear the strainer of the skin, for the benefit of a free perspiration; and the first object that saluted my eye was a child full of scrofulous ulcers, carried in the arms of one of the guides, under the very nose of the bathers. I was so shocked at the sight, that I retired immediately with indignation and disgust. Suppose the matter of those ulcers, floating on the water, comes in contact with my skin, when the pores are all open, I would ask you what must be the consequence? Good heaven, the very thought makes my blood run cold! We know not what sores may be running into the water while we are bathing, and what sort of matter we may thus imbibe; the king's evil, the scurvy, the cancer and the pox; and no doubt the heat will render the *virus* the more volatile and penetrating. To purify myself from all such contamination, I went to the Duke of Kingston's private bath, and there I was almost suffocated for want of free air; the place was so small, and the steam so stifling.

[12] Letter VI.

Two days earlier, Matthew's niece, Liddy, had written to her finishing-school friend:

> Bath is to me a new world: all is gayety, good-humor and diversion . . . . At eight in the morning we go in *dishabille* to the pump-room, which is crowded like a Welsh fair; and there you see the highest quality and the lowest tradesfolks jostling each other, without ceremony, hail fellow well met. The noise of the music playing in the gallery, the heat and flavor of such a crowd, and the hum and buzz of their conversation, gave me the headache and vertigo the first day; but afterwards, all these things became familiar, and even agreeable. Right under the pump-room windows is the King's bath; a huge cistern, where you see the patients up to their necks in hot water. The ladies wear jackets and petticoats of brown linen, with chip hats, in which they fix their handkerchiefs to wipe the sweat from their faces; but, truly, whether it is owing to the steam that surrounds them, or the heat of the water, or the nature of the dress, or all these causes together, they look so flushed, and so frightful, that I always turn my eyes another way. My aunt, who says every person of fashion should make her appearance in the bath, as well as in the abbey church, contrived a cap with cherry-colored ribbons to suit her complexion, and obliged Win to attend her yesterday morning in the water. But, really, her eyes were so red that they made mine water as I viewed her from the pump-room; and as for poor Win, who wore a hat trimmed with blue, what betwixt her wan complexion and her fear, she looked like the ghost of some pale maiden, who had drowned herself for love. When she came out of the bath she took asafoetida drops, and was fluttered all day; so that we could hardly keep her from going into hysterics; but her mistress says it will do her good; and poor Win curtsies with the tears in her eyes. For my part, I content myself with drinking about half a pint of the water every morning.
>
> The pumper, with his wife and servant, attend within a bar; and the glasses, of different sizes, stand ranged in order before them; so you have nothing to do but to point at that which you choose, and it is filled immediately, hot and sparkling from the pump. It is the only hot water I could ever drink without being sick. Far from having that effect, it is rather agreeable to the taste, grateful to the stomach, and reviving to the spirits. You cannot imagine what wonderful cures it performs. My uncle began with it the other day; but he made wry faces in drinking; and I am afraid he will leave it off. The first day he came to Bath, he fell into a violent passion; beat two blackamoors, and I was afraid he would have fought with their master; but the stranger proved a peaceable man. To be sure, the gout had got into his head, as my aunt observed; but I believe his passion drove it away, for he has been remarkably well ever since. It is a thousand pities he should ever be troubled with that ugly distemper; for when he is free from pain, he is the best tempered man upon earth; so gentle, so generous, so charitable, that everybody loves him; and so good to me, in particular, that I shall never be able to show the deep sense I have of his tenderness and affection.

As a final quotation, I use Bramble's comments about city life, written from London on 8 June: after discussing with enthusiasm the charms and advantages of the Welsh countryside, he writes:

Now mark the contrast at London. I am pent up in frowzy lodgings, where there is not room enough to swing a cat; and I breathe the steams of endless putrefaction; and these would, undoubtedly, produce a pestilence, if they were not qualified by the gross acid of sea-coal, which is itself a pernicious nuisance to the lungs of any delicacy of texture: but even this boasted corrector cannot prevent those languid sallow looks, that distinguish the inhabitants of London from those ruddy swains that lead a country life. I go to bed after midnight, jaded and restless from the dissipations of the day. I start every hour from my sleep, at the horrid noise of the watchman bawling the hour through every street, and thundering at every door—a set of useless fellows, who serve no other purpose but that of disturbing the repose of the inhabitants; and by five o'clock I start out of bed, in consequence of the still more dreadful alarm made by the country carts, and noisy rustics bellowing "Green peas" under my window. If I would drink water, I must quaff the mawkish contents of an open aqueduct, exposed to all manner of defilement; or swallow that which comes from the river Thames, impregnated with all the filth of London and Westminster. Human excrement is the least offensive part of the concrete, which is composed of all the drugs, minerals, and poisons, used in mechanics and manufacture, enriched with the putrefying carcasses of beasts and men; and mixed with the scourings of all the wash-tubs, kennels, and common sewers, within the bills of mortality.

This is the agreeable potation, extolled by the Londoners as the finest water in the universe. As to the intoxicating potion, sold for wine, it is a vile, unpalatable, and pernicious sophistication, balderdashed with cider, cornspirit, and the juice of sloes. In an action at law, laid against a carman for having staved a cask of port, it appeared, from the evidence of the cooper, that there were not above five gallons of real wine in the whole pipe, which held above a hundred; and even that had been brewed and adulterated by the merchant at Oporto. The bread I eat in London is a deleterious paste, mixed up with chalk, alum, and bone ashes; insipid to the taste, and destructive to the constitution. The good people are not ignorant of this adulteration; but they prefer it to wholesome bread, because it is whiter than the meal corn. Thus they sacrifice their taste and their health, and the lives of their tender infants, to a most absurd gratification of a misjudging eye; and the miller, or the baker, is obliged to poison them and their families in order to live by his profession. The same monstrous depravity appears in their veal, which is bleached by repeated bleedings, and other villainous arts, till there is not a drop of juice left in the body, and the poor animal is paralytic before it dies; so void of all taste, nourishment, and savor, that a man might dine as comfortably on a white fricassee of kid-skin gloves, or chip hats from Leghorn.

As they have discharged the natural color from their bread, their butcher's meat, and poultry, their cutlets, ragouts, fricassees, and sauces of all kinds; so they insist upon having the complexion of their pot-herbs mended, even at the hazard of their lives. Perhaps you will hardly believe they can be so mad as to boil their greens with brass half-pence, in order to improve their color; and yet nothing is more true. Indeed, without this improvement in the color, they have no personal merit. They are produced in an artificial soil, and taste of nothing but the dunghills from whence they spring. My cabbage, cauliflower, and 'sparagus, in the country, are as much superior in flavor to those that are sold in Covent Garden, as my heath-mutton is to

that of St. James's Market; which, in fact, is neither lamb nor mutton, but something betwixt the two, gorged in the rank fens of Lincoln and Essex, pale, coarse, and frowzy. As for the pork, it is an abominable, carnivorous animal, fed with horseflesh and distiller's grains; and the poultry is all rotten in consequence of a fever occasioned by the infamous practice of sewing up the gut, that they may be the sooner fattened in coops, in consequence of this cruel retention.

Of the fish, I need say nothing in this hot weather, but that it comes sixty, seventy, fourscore, and a hundred miles by land carriage; a circumstance sufficient, without any comment, to turn a Dutchman's stomach, even if his nose was not saluted in every alley with the sweet flavor of *fresh* mackerel, selling by retail. This is not the season for oysters; nevertheless, it may not be amiss to mention, that the right Colchester are kept in slime-pits, occasionally overflowed by the sea; and that the green color, so much admired by the voluptuaries of this metropolis, is occasioned by the vitriolic scum which rises on the surface of the stagnant and stinking water. Our rabbits are bred and fed in the poulterer's cellar, where they have neither air nor exercise, consequently they must be firm in flesh, and delicious in flavor; and there is no game to be had for love nor money.

I have, I realize, leaned more heavily on *Random* and *Clinker* than on any of Smollett's other works. Much material germane to my subject appears also in the other novels, but my own partiality for his first and last novels, as well as their high reputations, have led me to be a form-playing commentator. I hope that, even so, I have illuminated somewhat the role and accomplishment of Tobias Smollett, doctor of medicine and man of letters.

Robert Willan: The Solution of a Ninety-Year-Old Mystery

T. S. L. BESWICK*

THE importance of Robert Willan's contribution to dermatology needs no stressing, although it should not be forgotten that the influence which his work exerted was due in no small measure to the unselfish labour of his colleague and faithful disciple, Thomas Bateman, who did everything in his power to bring the value of Willan's work to the notice of the medical profession and never failed to acknowledge his own indebtedness to his teacher.

Willan's untimely death in 1812, at the age of fifty-five, prevented him from publishing the second volume of his work on skin diseases and, in consequence, robbed dermatology of what would have been a most valuable contribution. However, an additional section on porrigo and impetigo was published posthumously.[20] It is from Bateman's *A Practical Synopsis of Cutaneous Diseases,*[2] which was so deservedly popular that it ran through eleven editions, and his *Delineations of Cutaneous Diseases,*[4] both of which were inspired by Willan's teaching, that we learn almost all we know of Willan's views on the last four of his orders of cutaneous diseases: Pustulae, Vesiculae, Tubercula, and Maculae.

As long ago as 1866, Hilton Fagge drew attention to the odd fact that although Willan's book, *On Cutaneous Diseases,* Volume I,[18] did not appear in English until 1808, Hebra[8] and others refer to a German translation published nine years before. Hilton Fagge[5] concluded that "a publication which was at the time deemed worthy of translation into German has fallen into complete oblivion, having no doubt been eclipsed by the well-known later writings of its author."

This mystery of the 'missing edition' has received less attention of recent years but, as far as I know, has never been satisfactorily resolved. Most modern writers seem to have assumed that there cannot have been an earlier edition and that the edition dated 1808 must, in fact, have appeared in a number of parts or fasciculi between some date before 1799 and 1808, although Thorn-

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ton[12] mentions the possible existence of an earlier edition, and Haldin-Davis[7] states that the work appeared in parts from 1798 onwards and was published as a single volume in 1808.

Pusey[10] is very obscure. In his *History of Dermatology* he includes a photograph of the title-page of Willan's book which shows the title as *On Cutaneous Diseases* and bears the date of 1808; but in the text he gives the title as *Description and Treatment of Cutaneous Diseases,* saying that it appeared (presumably in parts) between 1798 and 1808 and constituted the first volume of *On Cutaneous Diseases,* London, 1808. It is obvious that this is a rather clumsy attempt to overcome the difficulty without having to postulate more than one edition of Willan's book.

As a matter of fact, there is a record of an earlier edition which had been overlooked by Hilton Fagge. In the *Bibliotheca Britannica* of Robert Watt,[14] under 'Robert Willan' we read the following entry:

> "Description and Treatment of Cutaneous Diseases; Order 1. Papulous eruptions on the Skin; coloured Plates, London. 1798, 4to; Ord 2. Scaly Diseases of the Skin. 1801. Ord 3. Rashes, 1st Part, containing the Varieties of Rubeola and Scarlatina, &c. Lond. 1805-7, 2 vols. 4to.

At first sight, this seems merely to lend confirmation to the view that there was but one edition of Willan's book and that it was published in parts. The edition of 1808, it is true, includes the rest of the third order, *exanthemata,* and the fourth order, *bullae,* but it might be argued that Watt had merely failed to notice the last part or parts published in 1808.

However, the title given by Watt is different from that of the edition of 1808, which is simply *On Cutaneous Diseases,* and resembles much more closely the title of the German edition, 'Die Hautkrankheiten und ihre Behandlung systematisch beschrieben.'

In the Kanthack Library of the Department of Pathology, Cambridge, there is a book which at first sight appears to be an incomplete copy of Willan's *On Cutaneous Diseases.* The title-page is missing and only the first two orders, *papulae* and *scaly diseases* are dealt with. However, closer inspection reveals that the text and illustrations are not identical with those of the edition of 1808. The only mention of Willan's name is on the spine of the book.

There are four possibilities which might account for the existence of this book, hereafter designated the 'X edition':

1. It is the earlier missing edition, the existence of which was postulated by Hilton Fagge.[5]

2. It is a later edition of which all trace has been lost.

3. It is a deliberate forgery.

4. It is not by Willan and was not originally ascribed to him, the ascription on the spine of the book being an error.

The fourth possibility can, I think, be ruled out at once. The text and illustrations resemble Willan's so closely that only deliberate plagiarism could possibly account for the resemblances.

Forgery also seems unlikely. It is difficult to imagine the motive, and anyone who intended that his forgery should be accepted as genuine would presumably refrain from altering the text.

The possibility of it being a later edition is harder to dismiss. A book-plate reveals that the book was at one time the property of J. W. Clark [1833-1910], Superintendent of the Museum of Comparative Anatomy at Cambridge from 1866 to 1891 and Registrar of the University from 1891 to 1910.

It seems improbable that it could have appeared between 1808 and Willan's death in 1812; surely Willan would have been far more likely to have devoted his energy to producing the second volume of his work than to rewriting the first.

It also seems improbable that it appeared within the next ten years, unless it were a deliberate forgery. Immediately after Willan's death his case books, notes, and manuscripts passed into the hands of his son-in-law, Ashby Smith. The latter edited and published in 1814 *A Practical Treatise on Porrigo or Scalled Head, and on Impetigo, the Humid, or Running Tetter,* "by the late Robert Willan."[20] In his preface Ashby Smith tells us that this was virtually the only manuscript dealing with skin diseases which Willan left in a state ready for publication, and that, with the addition of one plate and a few notes, which he is careful to distinguish from Willan's own notes, it was reproduced as it came into his hands. It is very unlikely that if Ashby Smith were to have reissued Willan's larger work he would have altered the text without drawing attention in footnotes to the liberties he had taken.

Bateman purchased the copyright of Willan's book and all his drawings and engravings sometime before 1817, in which year he published the first edition of his *Delineations of Cutaneous Diseases.*[4] Bateman was almost fanatically devoted to Robert Willan, and it is inconceivable that if he had reissued Willan's book he

would have so extensively altered the text; nor would he have allowed anyone else to do so if he could have prevented it. In any case his own books were so immediately successful that it would not have been worth his while to have done this.

Bateman died in 1821, and the 'X edition' could conceivably have appeared after his death, but this seems so unlikely that, in the absence of definite evidence to support it, this possibility need not be further considered. If it is remarkable that all trace of a book published in 1798 should disappear, it is surely still more remarkable that traces of a book published more than twenty years later should do so.

It therefore seems probable that on negative evidence alone we can regard the 'X edition' as the missing, earlier edition, referred to by Thomas Watt and postulated by Hilton Fagge. There is, however, positive evidence which makes the identification practically certain.

In the list of definitions in the 'X edition' (p. xiv) the 'vesicle' and the 'bulla' are not distinguished from one another, whereas in the edition of 1808 (p. xii) the two are clearly distinguished. We learn from Bateman[3] (p. 124) that Willan decided to separate these two as the result of a criticism contained in a paper published by Tilesius in 1802.[13]

Mr. E. C. Chamberlain of the Prints Department of the Fitzwilliam Museum has kindly examined the coloured illustrations in the two English editions and is of the opinion that those in the 'X edition' are earlier impressions than those in the edition of 1808, the plates having been repaired and in most cases slightly altered between the taking of the two sets of impressions. It should be remarked that the entirely worthless 'illustration' of psoriasis inveterata (1808, Pl. XIII) referred to by Bateman (1817, p. v) is not in the 'X edition.' Plate XIII in the 'X edition' depicts the whole hand; Plate XIII in the edition of 1808 was apparently prepared from the same block, but the fingers had been obliterated and the additional figure put in their place.

A study of the German translation already referred to[6] appears to settle the matter once and for all. The text describing the first two orders is an almost literal translation of the 'X edition' and is quite obviously different from the text of 1808. The prints were made from the same drawings but from different plates, rather poorly engraved. The 'illustration' of psoriasis inveterata is not included.

Appearances of Pimples, Scales, Raſhes, Veſicles, Puſtules, Tubercles, and Spots. The generic Diſtinctions to be comprized under each Order, will be as follows:

ORD. I. Strophulus (Red Gum, Tooth Eruption, &c.)
Lichen (Spring-Eruption, Scorbutic Pimples, &c.)
Prurigo (Gratelle, or univerſal Itching of the Skin)

ORD. II. Lepra (Leproſy of the Greeks)
Pſoriaſis (Dry or ſcaly Tetter)
Pityriaſis (Dandriff)
Ichthyoſis (Fiſh-ſkin)

ORD. III. Rubeola (Meaſles)
Scarlatina (Scarlet-Fever)
Urticaria (Nettle-Raſh)
Roſeola (Summer-Raſh, or Roſe-Raſh)
Purpura (Purple or Scorbutic Raſh)
Erythema (Red Raſh)

ORD. IV. Eryſipelas (St. Anthony's Fire)
Pemphigus (Veſicular-Fever)
Pompholyx (Water-blebs)
Herpes (Ringworm, Shingles, Wildfire, &c.)
Varicella (Chicken Pox)
Miliaria (Miliary Eruptions)
Eczema (Heat-Eruption)
Aphthæ (Thruſh)

ORD. V. Impetigo (Running Scab)
Ecthyma (Ulcerated Tetter)
Variola (Small Pox)
Scabies (Itch)
Porrigo (Scald Head, &c.)

ORD. VI. Phyma (Boils, Carbuncles, &c.)
Verruca (Warts)
Acne (Stone-Pock; red, tuberculated Face, &c.)
Lupus, or Noli me Tangere
Elephantiaſis (Arabian Leproſy)
Frambæſia (Yaws)

ORD. VII. Ephelis (Sun Spots)
Nævus
Spilus, Moles, and other original Marks

This Publication has been delayed much beyond the Author's Intention, in conſequence of the Difficulties experienced on a Subject entirely new, by the different Artiſts employed in compleating it. Theſe Difficulties being now, in a great meaſure, ſurmounted, the Work will proceed with more Expedition. The ſecond Order, comprizing the ſcaly Diſeaſes of the Skin, will be publiſhed as ſoon as the neceſſary Engravings are executed, and the Plates printed in colours.

R. WILLAN.

Red Lion Square, Nov. 2 , 1797.

FIG. 1. The back cover of Part I of the unbound first edition of Willan's book in the Library of the College of Physicians of Philadelphia. The probable publication date of this part was 1798. Compare with appendices A & B.

The copy of the German translation to which the author has had access consists of two volumes, one containing the text and one the illustrations. In addition to a title-page for the whole work, it contains separate title-pages for the four parts in which the work was issued. The dates of publication of these parts are: 1799, 1803, 1806, and 1816. The first part, in addition to covering the first order, Papulae (Blätterchen), also includes Willan's preface and definitions, a synopsis of Willan's book on the waters of Croft Spa,[15] and a summary of the whole of Willan's system of classification. The summary is extremely valuable since it is not included in the English edition of 1808 and is the only complete summary of Willan's system which we possess from his own hand. Its most useful contribution to the present discussion is that it shows the vesicular and the bullous eruptions grouped together in a single order, Bullae. It was presumably to this summary that Tilesius took exception, since those disorders which were later segregated to form the order Vesiculae are not described in any of the three editions. At the beginning of the last section there is another table showing the individual species comprising the different genera of the four orders dealt with in the four parts. The species in the first two orders correspond exactly to those of the 'X edition' but not to those of the edition of 1808. The species in the third and fourth orders, Exanthemata and Bullae, do correspond to those of the edition of 1808; unfortunately, no comparison can be made with the 'X edition' since these two orders are not included in it. The last part also includes a summary of an article by Savary[11] on the history of pemphigus.

While this paper was being prepared for the press, the author's attention was drawn to the fact that the catalogue of the College of Physicians of Philadelphia listed two editions of Willan's work. One is entitled *Description and Treatment of Cutaneous Diseases* and dated 1797-1805; the title of the other is *On Cutaneous Diseases* and it is dated 1808.

Mr. W. B. McDaniel, 2nd, Curator of the Library of the College of Physicians, has very kindly supplied details of the two editions. The text of the earlier is identical with that of the 'X edition' and, of course, differs from the edition of 1808. The earlier edition, fortunately, has never been bound, and with the exception of the first part, which lacks the front cover, all the three parts of which it consists retain their original paper covers. Figures 1-3 reproduce the back cover of the first part and the front covers of parts 2 and 3.

DESCRIPTION AND TREATMENT

OF

CUTANEOUS DISEASES.

ORDER II.

SCALY DISEASES

OF THE

SKIN.

BY

ROBERT WILLAN, M. D. F. A. S

LONDON:
PRINTED FOR J. JOHNSON, ST PAUL'S CHURCH-YARD

1801

Where may be had the First Order

FIG. 2. The front cover of Part II of the first edition (Philadelphia copy).

DESCRIPTION AND TREATMENT

OF

CUTANEOUS DISEASES.

ORDER III. RASHES.

PART I.

CONTAINING THE VARIETIES OF

RUBEOLA AND SCARLATINA.

BY

ROBERT WILLAN M.D. F.A.S.

LONDON:

PRINTED FOR J. JOHNSON, ST. PAUL'S CHURCH-YARD.

1805.

Where may be had the First and Second Orders.

FIG. 3. The front cover of Part III of the first edition (Philadelphia copy).

This copy thus provides final proof that two editions of Willan's work bearing different titles were published and that the first was issued in parts with paper covers. The date of publication of the first part is still uncertain, but the late 1797 date on the back cover of part I makes it reasonable to assume that Robert Watt is correct in giving the publication date as 1798.

It remains to try to account for the obscurity which has surrounded this earlier version of Willan's text. Here one can only speculate. It is odd that Willan himself does not refer to the earlier edition in the Introduction to the edition of 1808. Bateman, in his life of Willan,[1] makes no mention of the fact that there were two different editions, although he gives the date of publication of the first part as 1798, and of other parts as 1801, 1805, and 1808.

When Robert Willan competed for and won the Fothergillian Gold Medal of the Medical Society of London in 1790, he was a comparatively unknown physician practising at the Carey Street Public Dispensary. The Society[9] (1790) recommended that he publish his prize-winning essay on cutaneous diseases with such additions and alterations as he should consider desirable; nevertheless, nothing appeared for eight years. We know nothing of the reason for the delay. No doubt it was partly due to the time required to prepare the drawings from which the copperplate engravings were to be made. Willan, never a very wealthy man, presumably had to have this done at his own expense. Another cause for delay might have been the difficulty of finding a publisher who would undertake the publication of a book lavishly illustrated with coloured plates. This was an innovation in dermatological literature and although Willan at that time (1790) was not unknown in London medical circles his reputation was not so great as to ensure the sale of an undoubtedly very expensive book on a sufficiently large scale to tempt a publisher. When J. Johnson of St. Paul's Churchyard did undertake to publish the book, he doubtless took the view that it was safer to issue it in parts, so that if the first part was a failure money need not be wasted on the production of further parts. Similar considerations probably led him to limit the number of copies which were printed. The first part duly appeared in 1798, followed three years later by the second part. I suggest that by the time the fourth part appeared in 1807, Willan's reputation and that of his book had so increased that the publishers found themselves faced with a demand for earlier parts which they were unable to meet. Another impression was out of the question because

the type had long since been broken up. To meet the demand the type would have to be reset, and this gave Willan an opportunity of making alterations to the text.

Although in both editions the first two orders occupy the same number of pages, 212, there is considerably more material in the edition of 1808 than in the 'X edition.' This has been achieved by compressing the text of the earlier edition, without omitting anything of importance, in order to make room for the new matter. As an example we can take the account of the 'horny girl,' Ann Jackson, described at the end of the section on 'Scaly Diseases' (1808, pp. 210-2). In the earlier edition ('X edition,' pp. 210-2) the account occupies twenty-three lines more than in the 1808 edition. Willan makes use of the space saved to include an account of another case, that of N. Hume, which is not mentioned in the 'X edition.' Examples of this kind could be multiplied and would of themselves offer proof, if further proof were needed, that the 'X edition' was the earlier of the two. It is impossible to say for certain whether the whole work, with the revised text, was issued as a single volume in 1808, but it seems probable that it was. Even so, the last part must also have been issued separately for the convenience of those readers who had already purchased the earlier parts. I am informed that the text of the first two sections of the copy of *On Cutaneous Diseases* in the Library of the Surgeon-General [now the National Library of Medicine] is that of the 'X edition' and not that of the Cambridge University copy of the 1808 edition. The obvious explanation of this difference is that the American copy comprises the separate fasciculi, purchased as they became available and bound together when the last part had been issued, whereas the Cambridge University Library copy was purchased as a single volume, which appeared in 1808, and embodied the alterations which Willan had made in the text of the first two parts. The Surgeon-General's copy contains the same title-page as the Cambridge 1808 edition; it was presumably issued with the last part. It is not possible to say on the evidence so far available whether more than one version of the text of the third and fourth parts exists: these are the sections dealing with rubeola, scarlatina, and the Bullae, and they are not included in the copy of the 'X edition' in the Department of Pathology, Cambridge.

It seems most improbable that the copy in the Library of the Surgeon-General is unique, and no doubt other libraries possess similar copies. Few libraries possess more than a single copy of

CUTANEOUS DISEASES.

VOL. I.

CONTAINING

ORD. I. PAPULÆ.
ORD. II. SQUAMÆ.
ORD. III. EXANTHEMATA.
ORD. IV. BULLÆ.

BY

ROBERT WILLAN, M.D. F.A.S.

LONDON:

PRINTED FOR J. JOHNSON, ST. PAUL'S CHURCH-YARD.

1808.

[J. G. Barnard, *Printer*, Snow-Hill.]

FIG. 4. The title-page of the second edition, 1808. From the copy in the University Library at Cambridge.

Willan's book and it is most unlikely that anyone who did not compare the two texts side by side would notice the differences between them. Even the differences between the two sets of illustrations are not obvious at a glance.

By reference to Appendices C and D, librarians and others who may be interested should be able to decide whether a particular copy embodies the earlier or the later version of the text. Other points of difference are the case of N. Hume, at the very end of the chapter on Icthyosis [*sic*], which is not included in the earlier text, and paragraph 7 at the end of the chapter on prurigo, also not included in the earlier version which stops at paragraph 6.

The problem of distinguishing these two texts in library catalogues and book lists still remains. Presumably the logical way would be to give the date of publication of volumes containing the earlier text as 1798 (?)-1808 and the date of publication of copies embodying the later text as 1808. However, since almost all copies appear to be listed with their date of publication as 1808, some other method will have to be adopted, at least until all libraries have examined their copies and amended their catalogues where necessary.

The original owner of the copy of the 'X edition,' now in the Department of Pathology at Cambridge, must have had the first two parts bound without waiting for the appearance of further parts or for the title-page and table of orders, genera and species which, presumably, were due to come out with the last part. Of the identity of the first owner no clue remains. The synopsis of Willan's whole scheme of classification of skin diseases found in the first part of the German translation, and already referred to, was in the first part of the earlier English edition, too, but must have been lost before the parts were bound.

It appears that the Philadelphia octavo edition of 1809[19] incorporated the later version of the text, as might have been expected.

SUMMARY

Ninety years ago, Hilton Fagge drew attention to the fact that although Robert Willan's *On Cutaneous Diseases* was not published in England until 1808, Hebra and others refer to a German translation of 1799. Fagge postulated the existence of an earlier edition, all trace of which had been lost.

Evidence is adduced to show that an earlier edition did in fact exist and that an imperfect copy of this earlier edition is to be found in the Kanthack Library of the Department of Pathology at Cambridge.

It is suggested that the scarcity of the earlier edition may be more apparent than real: other libraries may possess copies hitherto regarded, as was the one described in this paper, as copies of the edition of 1808.

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Mr. S. W. Bateman and Mr. C. Sutton prepared the photographs for the figures.

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(*Note.* The plates in Part I are all dated Oct. 1, 1796; those in Part II bear various dates between May 1, 1796 and May 1, 1799; one plate is undated.)

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Vol. I. pp. i-x & 1-82, Plates I-VII. Breslau, Hirschberg und Lissa in Südpreussen, J. F. Korn, dem aeltern, 1799. Order I-Papulae.

Vol. II. pp. 83-158, Plates VIII-XIX. Breslau, J. F. Korn, dem aeltern, 1803. Order II-Squamae.

Vol. III. pp. 159-302, Plates XX-XXIV. Breslau, J. F. Korn, der ältere, 1806. Order III-Exanthemata, pt. i.

Vol. IV. pp. i-viii & 303-437. Plates XXV-XXXIII. Breslau, W. A. Holäufer, 1816. Order III, pt. ii & Order IV-Bullae.

Text bound in one volume, plates in a second. Presented to the Newcastle-upon-Tyne Infirmary Medical Library by Dr. Winterbottom.* Now in the Library of King's College, Newcastle-upon-Tyne. Volume I contains a summary of Willan's book on the waters of Croft Spa (*v. supra*) and Volume IV a summary of Savary's article on the history of pemphigus (*v. supra*).

Another copy is listed in the *Index-Catalogue of the Library of the Surgeon-General of the United States of America,* 1895, vol. XVI; only the first three parts are included: the entry is as follows: "Willan, (Robert). Die Hautkrankheiten und ihre Behandlung systematisch beschrieben. Aus dem Englischen übersetzt, und mit einingen Anmerkungen und einem Anhange begleitet von Friedrich Gotthelf Friese. 3v. in 1, paged consecutively. x, 302 pp., 24 pl., 4°. Breslau, J. F. Korn, 1799-1806."

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For some biographical details about Robert Willan see:

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* This is Dr. Thomas Masterman Winterbottom (1765-1859), a native of South Shields and apparently the translator of the paper by Tilesius (1802) (*q.v.*) which led Willan to separate the bullous and the vesicular eruptions. Dr. Winterbottom presented a number of books to the library at the Royal Infirmary (originally the Newcastle-upon-Tyne Infirmary); he also published several works of his own, mainly concerned with tropical medicine and hygiene (see Emmerson, J. S. *Univ. Durham med. Gaz.,* December, 1955).

APPENDIX A

Willan's Original Arrangement of the Orders and Genera

Taken from the first part of the German translation (Friese), Breslau, 1799, pp. vii-ix.

Note that the bullous and vesicular eruptions are grouped together in the fourth order. See also Figure 1.

Erste Ordnung
- Strophulus
- Lichen
- Prurigo

Zweite Ordnung
- Lepra
- Psoriasis
- Pityriasis
- Ichthyosis

Dritte Ordnung
- Rubeola
- Scarlatina
- Urticaria
- Roseola
- Purpura
- Erythema

Vierte Ordnung
- Erysipelas
- Pemphigus
- Pompholyx
- Herpes
- Varicella
- Miliaria
- Eczema
- Aphthae

Fünfte Ordnung
- Impetigo
- Ecthyma
- Variola
- Scabies
- Porrigo

Sechste Ordnung
- Phyma
- Verruca
- Acne
- Lupus
- Elephantiasis
- Frambaesia

Siebente Ordnung
- Ephelis
- Naevus
- Spilus, Moles und andere angeborne Mäler.

APPDENIX B

Willan's Final Arrangement of the Orders and Genera

Taken from Bateman's *Synopsis of Cutaneous Diseases*, 3d ed., London, 1814, p. xxiv.

Note that the bullous and vesicular eruptions have been separated; the latter now constitute a separate order, the sixth.

	ORDER I
Papulae	Strophulus
	Lichen
	Prurigo
	ORDER II
Squamae	Lepra
	Psoriasis
	Pityriasis
	Ichthyosis
	ORDER III
Exanthemata	Rubeola
	Scarlatina
	Urticaria
	Roseola
	Purpura
	Erythema
	ORDER IV
Bullae	Erysipelas
	Pemphigus
	Pompholyx
	ORDER V
Pustulae	Impetigo
	Porrigo
	Ecthyma
	Variola
	Scabies
	ORDER VI
Vesiculae	Varicella
	Vaccinia
	Herpes
	Rupia

	Miliaria		Acne
	Eczema		Sycosis
	Aphtha		Lupus
			Elephantiasis
	ORDER VII		Framboesia
TUBERCULA	Phyma		
	Verruca		ORDER VIII
	Molluscum	MACULAE	Ephelis
	Vitiligo		Naevus, Spilus, etc.

APPENDIX C

WILLAN'S ORIGINAL ARRANGEMENT OF THE SPECIES WITHIN THE FIRST TWO ORDERS

Taken from the German translation, part IV (Friese), Breslau, 1816, p. vii. This arrangement is exactly the same as that in the 'X edition.' Compare with Appendix D.

ERSTE ORDNUNG. PAPULAE

I. STROPHULUS	1. intertinctus	III. PRURIGO.	1. mitis.
	2. albidus		2. formicans
	3. confertus		3. senilis
	4. volaticus		4. podicis
	5. candidus		5. praeputii
II LICHEN	1. simplex		6. urethrae
	2. agrius		7. pubis
	3. pilaris		8. scroti
	4. lividus		9. pudendi muliebris
	5. tropicus		

ZWEITE ORDNUNG. SQUAMAE

I. LEPRA	1. vulgaris		6. scrotalis
	2. alphoides		7. infantilis
	3. nigricans		8. inveterata
II PSORIASIS	1. guttata	III. PITYRIASIS	1. capitis
	2. diffusa		2. versicolor
	3. gyrata		
	4. palmaria	IV. ICHTHYOSIS	1. simplex
	5. labialis		2. cornea

APPENDIX D

WILLAN'S FINAL ARRANGEMENT OF THE SPECIES WITHIN THE FIRST FOUR ORDERS

Taken from *On Cutaneous Diseases,* London, 1808, frontispiece.

Note the differences between the species comprised within the first two orders in this table and that in Appendix 'C.' The arrangement of genera and species in the second and third order is the same in the German translation as it is in the English edition of 1808.

ORDER I. PAPULAE

I. STROPHULUS	1. intertinctus	II. LICHEN	1. simplex
	2. albidus		2. pilaris
	3. confertus		3. circumscriptus
	4. volaticus		4. agrius
	5. candidus		5. lividus
			6. tropicus

III. PRURIGO
1. mitis
2. formicans
3. senilis
4. podicis
5. praeputii
6. urethrae
7. pubis
8. scroti
9. pudendi muliebris

ORDER II. SQUAMAE

I. LEPRA
1. vulgaris
2. alphoides
3. nigricans

II. PSORIASIS
1. guttata
2. diffusa
3. gyrata
4. palmaria
5. labialis
6. ophthalmica
7. praeputii
8. scrotalis
9. unguium
10. infantilis
11. inveterata

III. PITYRIASIS
1. capitis
2. rubra
3. versicolor

IV. ICHTHYOSIS
1. simplex
2. cornea

ORDER III. EXANTHEMATA

I. RUBEOLA
1. vulgaris
2. sine catarrho
3. nigra

II. SCARLATINA
1. simplex
2. anginosa
3. maligna

III. URTICARIA
1. febrilis
2. evanida
3. perstans
4. conferta
5. subcutanea
6. tuberosa

IV. ROSEOLA
1. aestiva
2. autumnalis

3. annulata
4. infantilis
5. variolosa
6. vaccina
7. miliaris

V. PURPURA
1. simplex
2. haemorrhagica
3. urticans
4. contagiosa

VI. ERYTHEMA
1. fugax
2. laeve
3. marginatum
4. papulatum
5. tuberculatum
6. nodosum

ORDER IV. BULLAE

I. ERYSIPELAS
1. phlegmonodes
2. oedematodes
3. gangraenosum
4. erraticum

II. PEMPHIGUS
1. vulgaris
2. contagiosus
3. infantilis

III. POMPHOLYX
1. benignus
2. diutinus
3. solitarius

Iconographies of Medical Portraits

BRUNO KISCH*

AN iconography of medical portraits in a general sense involves medical history as well as an analysis of human personalities; it also involves fine arts and cultural history.[1] A bibliography of the subject was first attempted in a book by Moehsen (1771), and recently, in a short outline only, in the valuable introduction to medical history by Walter Artelt.[2]

Iconography, as spoken of in this paper, means the enumeration of outstanding physicians through a recording of their portraits, also an attempt to list as many pictures as possible of one person. Iconographies may be of different types. One type deserving this name is the catalogue which merely describes the individual portraits; this type may be called descriptive iconography without illustrations. In this group belong books like the one by Moehsen (1771) describing in detail his own great collection of portraits of medical men. In this category also belong dealers' catalogues. They are a valuable source of information, especially if they are scientifically assembled. Such an example is the catalogue of the auction of medical coins and medals held by the auctioneer, R. F. Nothwanger, in Danzig in 1869. This catalogue lists Dr. Carl Ludwig von Duisburg's collection of medals in honor of famous physicians and natural scientists. Over a period of fifty years, von Duisburg (a physician in Danzig) assembled this group of 875 pieces which was scattered to all corners of the world by the auction. A similar coin catalogue which first used as its title "Medicina in Nummis"—a phrase which was to be frequently employed in later years—was published (1905) by the Berlin firm of coin dealers, Robert Ball, representing the collection of medical medals of the late founder of this enterprise, Robert Ball.

The other type of iconography is that which contains reproductions of the portraits in addition to the text: this is of course the more valuable but, due to the high cost of printing, also the rarer type. There are many well-known iconographies of this kind

* New York City.

1 The writer was inspired to present this paper, after collecting the literature for a long time, by the stimulating content of John F. Fulon's study in humanism in relation to medical bibliographies. (*The great medical bibliographers, a study in humanism.* Philadelphia, University of Pennsylvania Press, 1951.)

2 Artelt, Walter. *Einführung in die Medizinhistorik.* Stuttgart, F. Enke, 1949.

of famous persons who were not physicians, for instance the poet and scientist, Goethe,[3] and his famous prince, Carl August of Weimar,[4] or the iconography of Spinoza by Ernst Altkirch.[5]

Biographies of physicians or textbooks of medical history also contain many portraits, but these pictures are only an accessory to the text and more or less selected at random. They often do not even portray the typical expression of the personality described and therefore may be regarded as sources for an iconography but not iconographies proper. The same may be said of general iconographies containing only an occasional portrait of some physician.[6]

The publication of iconographies of portraits started later than the publication of bibliographies. This is understandable in spite of the fact that the art of portraiture was already highly developed in classical times, and especially in Roman times. The collections of Roman portraits busts at the Vatican in Rome or at the Museo Nazionale in Naples are impressive because of the significant details in the features, and are far different from the cool, impersonal stylistic beauty of Greek statues and heads. Roman busts already display the modern individualistic character of a portrait. The heads presented on the coins of imperial Rome are really portraits, not schematic, beautified features; they are so personal that without reading the inscription one may immediately recognize a coin as representing the head of Vespasian or Nero, etc. Realistic portraiture was by no means invented by the Romans but had already been developed to a high degree in the portrait paintings found in early Egyptian sarcophagi and in the statues of Egypt at the time of the old Kingdom (about 3000 B.C.). This art, and the technique of it, were apparently lost during the later medieval period, probably because interest in the true features of a certain personality no longer existed at that time. Artistry was surely influenced then by the approach to life of early Christianity. The features of human beings did not count so much any more, names were not so important, everything was subordinated to the idea and expectation of the world after death. The portraits of rulers on coins disappeared, a cross or some other symbol was substituted, and where

[3] Rollett, Hermann. *Die Goethebildnisse.* Wien, W. Braumüller, 1883. Stahl, Fritz. *Wie sah Goethe aus?* Berlin, Georg Reimer, 1904.

[4] Wahl, Hans. *Die Bildnisse Carl Augusts' von Weimar.* Weimar, Verlag der Goethe-Gesellschaft, 1925.

[5] Altkirch, Ernst. *Spinoza im Portrait.* Jena, E. Diederichs, 1913.

[6] For instance: Neumann, Jos. *Beschreibung der bisher bekannten Böhmischen Privatmünzen und Medaillen.* Prag, Verein f. Numismatik, 1852-1870, 4°. 840 pp., 84 pl.; Bergmann, Joseph. *Medaillen auf berühmte und ausgezeichnete Männer des Oesterreichischen Kaiserstaates.* Wien, Tendler u. Co., 1858, 8°. 681 pp., 25 pl. Many others.

the ruler's figure appeared, as for instance on medieval bracteats, it is scarcely recognizable as a specific individual, and is not a portrait at all.

The changes in the working of the human mind and of human interests in the centuries of the Renaissance led once more to a high appreciation of personalities who had contributed something of importance to life. Names of artists appeared on pictures, or at least their individual symbols, and the art of portraiture was revived in painting and sculpture.

In earlier times the Roman emperors had had portrait medals made, as a rule in gold, to be given as a gift to outstanding friends and to princes. In the Italian Renaissance the portrait medal was revived for the first time in the form of extremely valued pieces made by the great artists of the time. Along with this interest in the appearance and features of outstanding contemporary personalities there was revived also an interest in the appearance of the heroes of bygone times. Ancient busts of great poets such as Homer, of rulers and politicians, were rediscovered. In particular, the portraits on coins and carved stones stimulated interest in the collection and description of such pictures. Here started also the iconography of medical portraits.

From antiquity and medieval times not much of the material under discussion existed. Pictures of Hippocrates were common; pictures of the medical saints, Cosmas and Damian, were available. During the Renaissance, however, and up to the nineteenth century portraits were frequently made—paintings as well as etchings —and portrait medals became extremely popular. A descriptive summary of such portraits (iconography) had to overcome difficulties much greater than those of compiling bibliographies, especially since as a rule fewer copies of a certain picture or medal were made than of a particular book, and the existence of the manufactured issues was much more endangered than that of books.

Iconographies of medical portraits can be of a general and summarizing nature, embracing all known portraits of all famous physicians. In older times these men were never physicians exclusively, but also scientists at large. Other iconographies may be restricted to physicians of a certain country or even of a certain town or university or a certain time. Such books were extremely popular in the sixteenth and seventeenth centuries. One by Tobias Fendt (1574) had four different editions between 1574 and 1636.

In 1597 Johann Jacob Boissard published a similar iconography of scholars in Frankfurt with many subsequent volumes and editions through 1669.[7] This type of iconography of scholars, especially of certain universities, is still being published today, as for example the contemporary pictures of the teachers of medicine in German universities, issued in 1933 by the *Münchner medizinische Wochenschrift.*

Finally, an iconography may concern a single person only, an attempt being made to give a description and, if possible, reproductions of all portraits available for this individual. Such endeavors have to include not only the portraits given in sculpture, in painting, and in prints, but also the extant numismatic items, and in modern times also the philatelic items. Contemporary medals, particularly before 1839 when photography was invented, were often of greater value for the iconographer than portraits and etchings, which in the seventeenth and eighteenth centuries were occasionally of a low artistic quality. A masterly specimen of a medical iconography of a single person is Arthur Weese's Iconography of Albrecht von Haller (1909) or Spielmann's *Iconography of Vesalius* (1925).

As with every bibliography, an iconography of portraits starts with the collecting of extant material. The first known collectors did not bring together portraits of famous physicians exclusively, but of personalities outstanding in the history of mankind at large. The early endeavours of this kind are not too trustworthy. One of the first printed iconographies, or more exactly, a book containing many pictures of famous persons, is the Chronicle of Dr. Hartmann Schedel, first printed at Nürnberg in 1493. The so-called portraits which it contains were made by two great artists, Michael Wolgemuth, the teacher of Albrecht Dürer, and Wilhelm Pleydenwurf. About twenty medical men are depicted in this book, whose author was himself a physician. The pictures, however, are not portraits, but rather a kind of symbol. These "portraits," as Moehsen (1771) had emphasized, were used in the book interchangeably to depict various persons in a most unsophisticated way. For example, the picture given as that of the famous Matthiolus, teacher of Schedel in Padua, under whom he graduated there, was used in the same book to represent the prophet Jonas and the philosopher Epimenides. And Moehsen further mentions that the portrait of

[7] As mentioned in Moehsen (1771).

Johannes de Monteville in the Chronicle also represents the portrait of Paris of Troy, the Biblical Nehemiah, the poet Menander, the famous teacher of Charlemagne, Alcuin, and the poet Dante. This should be proof enough that the earliest iconographies of medical portraits can easily be discarded, or at least used only with a great deal of scepticism. Only later, under the influence of personalities like Martin Schonauger, Lucas Cranach, and others, when etching, engraving, and woodcuts turned from exclusively depicting saints and holy scenes to presenting life as it was, did the portrait as a means of preserving the features of a certain personality become increasingly important. By the sixteenth century there are already an abundance of personal portraits in sculpture, in graphic, and in medalistic art. From then on there was a real possibility of collectors of portraits getting what they wanted, that is the impression of how a certain personality appeared in the eyes of a contemporary artist.

However, it would be a mistake to think that the use of fantastic pseudoportraits to instruct the reader of a book about the appearance of its heroes was a technique used only in the early days of printing when the vast majority of the population was illiterate. Even in the midst of the sophisticated eighteenth century a very expensive and elaborate book was printed in Rome,[8] presenting in fine etchings 112 folio pages of "portraits" of all the rulers and other outstanding personalities mentioned in the Bible, and many other historical but not Biblical portraits. The psychology of the artist or the reader of such a portrait collection can hardly be understood at the present time.

Among the early bibliographers we find also the earliest iconographers. Cornelius von Beughem, well known for his *Bibliographia medica et physica* (Amsterdam, 1681), published in 1688 his *Bibliographia historico-chronologica* and added to it an iconography of portraits in etching of "Grosse Herren, Gelehrte und Künstler." Among them[9] were only 263 physicians, whose names he mentioned without identifying the artists who made the portraits. Another seventeenth century iconography is that of John Evelyn who in 1697 published a book in folio in London under the title, *Numismata, a Discourse of Medals ancient and modern, together with some Account of Heads and Effigies of illustrious and*

[8] Gaius, Bartholomaeus. *Epitome historico-chronologica.* Rome, Faustis Annileis, 1751.
[9] According to Moehsen (1771).

Abbildung 44

Bücherzeichen I des Dr. Karl Wilhelm Möhſen

Kupferſtich von Johann Ernſt Gericke 1757, verkleinert

Mochsen's bookplate. From Kuno Waehmer's *Bücherzeichen deutscher Ärzte* (Leipzig, 1919).

famous Persons in sculps and Taille douce, of whom we have no medals extant, and of the use to be derived of them. On page 261 one finds a list of 44 names of famous physicians whose portraits at that time were extant in England.

Moehsen (1771) mentions a publication, *Epistola gratulatoria ad Apinum,* the author of which was allegedly Dr. Conrad Berthold Behrends, in his time a famous physician. This book contains a catalogue of pictures of physicians amounting to 381. A contemporary of Moehsen, a Doctor Heister, was able to assemble an unusually great collection of medical portraits. In 1759 his library was sold at auction, and the catalogue lists also his portrait collection of some six hundred and eighty-odd items.

Outstanding among these early iconographic books of medical portraits is that of J. C. W. Moehsen (1771) of Berlin, personal physician to King Frederick of Prussia. In his "Catalog of a collection of pictures mainly of famous physicians . . ." he enumerates the more than 2,720 pictures (etchings and woodcuts) of his own collection, representing the features of 1,228 physicians. Moehsen's book is in two parts: one of 243 pages consists of different papers on the history of art, of medicine, and cultural history, with valuable information on medical illustrations in general; the second part of 240 pages (which the publisher also sold as an independent book) contains not only the catalogue of Moehsen's collection of medical portraits, but also the first bibliography of iconographic books on medical portraits (pp. 163-223). In this field of bibliography, Moehsen was an outstanding pioneer and had no worthy successor. His catalogue also records especially among the portraits those physicians who were not listed in the contemporary biographical encyclopedias.

Moehsen's collection must have been of tremendous extent because, as he mentions on page 156, this catalogue of 2,720 pictures represents only part of it, omitting pictures referring to medical history and even portraits of empirical healers, surgeons *(Wundaerzte),* pharmacists, chemists, and laboratory aides. He intended to publish this part later. Of special interest is the fact that he added to his catalogue (pp. 157-162) a list of desiderata, viz. medical portraits known to him from the literature but not in his own collection. Moehsen published only one other important book in the field of medical iconography: a description of the most outstanding items in his collection of medical coins and medals (1773),

together with good reproductions of many of the medals. The second volume of this work presented a history of science in the Mark Brandenburg up to the end of the seventeenth century. Among medical men Moehsen's contribution to iconography fostered an interest in the history of medicine as well as in iconography, and especially in collecting portraits and medals of famous physicians.

The next great collector, and at the same time iconographer of this topic, was Carl Asmund Rudolphi. He was born in 1771 in Stockholm, became professor at the University of Greifswald in 1796, and in 1810 finally Professor of Anatomy and Physiology at Berlin University. We owe to the anatomist, Burdach, an account of how Rudolphi, the teacher and predecessor of Johannes Müller, became interested in iconography.[10] Rudolphi was an eager collector of the old literature on anatomy and physiology and once, while hunting such books for his library, he found a group of portraits of famous physicians. He acquired this lot and tried, following Moehsen's example, to complete it as much as possible. He soon discovered that a collection of medical portraits will always be incomplete without including the medals struck in honor of physicians. This recognition made Rudolphi a famous coin collector, and he left at his death not less than 9,334 portrait medals, among which of course only a fraction were of physicians. The greatest part of this collection was acquired between 1825 and 1832 the year of Rudolphi's death. His contribution to iconography consisted of a book issued in 1823 and reprinted and revised in 1825 and 1829. The second edition of this book contains a *laudatio* and dedication to Blumenbach, a short introduction and an index of medical medals struck in honor of physicians. It contains 523 such medals concerned with 350 physicians. The interest in this booklet of 131 pages must have been considerable. Every medal is well described, but unfortunately only the medal in honor of Blumenbach, struck in 1825 to mark the semicentennial of his doctorate, is depicted. Apparently the beauty of medals appealed very much to the taste of historically minded physicians and other collectors, because in the nineteenth century we find iconographies mainly of medals and rarely of pictures, prints, and woodcuts. Only when the new method of photography made possible true-to-life pictures of famous men did interest in this kind of collection

[10] Burdach, K. F. *Rückblick auf mein Leben.* Leipzig, L. Voss, 1848, p. 351.

start again, but it could hardly compete with that of collecting medallic portraits. Carl Ludwig von Duisburg, physician and surgeon at Danzig, published a final edition of Rudolphi's book. This excellent and greatly enlarged revision in the Latin language appeared in 1862, with supplements in 1863 and 1868. It contains medals struck in honor of 611 physicians, with seven pages of references and an appendix of medals struck in honor of aeronauts and on the occasion of conventions of German scientists and physicians. An index of the physicians and another of the artists makes this work an extremely valuable reference book. Von Duisburg died on 11 September 1868. Two supplements to his book were published by the physician, E. Rüppell (1876, 1877). The catalogue of his own collection of 875 medals of famous physicians was published for the auction (1869).

Germany was not the only country where collectors delighted in the topic of medical medals. Professor Hippolyte Kluyskens, a famous surgeon of the University of Gand, published in 1859 an iconography of medals under the title, "Medailles des hommes célèbres," among them many physicians and scientists. This iconography is remarkable because Kluyskens gave a short biography of each person in whose honor these medals were struck. The description of his collection comprising more than 1,200 pieces was published in 1886 at Gand. In the *Revue Belge Numismatique*, Kluyskens had published in 1874 an article, "Numismatique Jennerienne." Another trial of specific medical iconography was published in 1896 by Dr. L. Pfeiffer in Weimar on the occasion of the Jenner celebration and contains a collection of medals, portraits, and pictures concerning E. Jenner,[11] and a list of portraits of Jenner himself and of physicians who had favored or opposed the introduction of vaccination.

Another contribution to iconography concerned with portraits of physicians was the previously mentioned catalogue of Robert Ball (1905) in Berlin, with no less than 1,777 items, among them 1,029 in honor of physicians. The name of this catalogue, "Medicina in Nummis," was again used when in 1937 A. Holzmair published a valuable catalogue of the collection of the late Dr. Joseph Brettauer, ophthalmologist in Trieste, who bequeathed his entire collection to the University of Vienna, which received it in 1907, two years after the death of Brettauer. This catalogue is outstand-

[11] Pfeiffer, L. *Zur Jennerfeier des 14. Mai 1896.* Tübingen, H. Laupp, 1896. 64 pp.

ing in its scientific approach to the entire problem and the very reliable information given about the medals, as well as the authenticity of the portraits. Only a part of Brettauer's collection of 5,557 medical items in coins and medals are portrait medals of physicians, but even this part of the catalogue contains no less than 1,347 items. Probably Brettauer assembled the largest number of medical coins and medals ever collected by a single person.

To these books should finally be added the volume published and edited by Malcolm Storer of Boston in 1931. It is a summary of all medals concerning medicine from the collection of his father H. R. Storer (1830-1922) as well as from other collections. Among these medals are 3,836 of physicians and scientists and more than 80 in honor of dentists. In the number of items listed the Storer catalogue surpasses that of the Brettauer collection. However, it contains not only nonphysicians such as Goethe and others, but also persons who are called "Doctor" on the medal and who are really doctors of another faculty, for example the Burgermeister of Vienna, Dr. Lueger.

Apparently the greatest collection of medical portraits ever assembled by a single person was that of the physician Geheimrat Dr. Heinrich Wolff of Bonn who possessed 12,000 etchings, woodcuts, and other kinds of portraits of physicians, natural scientists, and quacks of all countries. Wolff had the good fortune to purchase and incorporate into his own carefully acquired collection five similar ones, among them those of a Dr. Diamond in London and of Hofrat Sachse in Schwerin, Germany; most remarkable and astonishing of all is that he also bought the collection of the Leopoldina Carolina Academy of German Scientists. In 1885 this tremendous collection was offered for sale by the book dealer, F. A. Prestel in Frankfurt, and the catalogue with its four-page introduction in German and French and 176 pages of text is a valuable iconography of medical portraits and a memorial to this physician, outstanding among the collectors in medical history.

There are finally certain minor iconographies of medical portraits published on special topics in the last century which are important from the viewpoint of medical history. There is a large series of portraits of the deans of the Paris medical faculty preserved on the jetons which the deans of the medical faculty of Paris were entitled to coin during the years of their deanship. Good descriptions of these little tokens in silver and brass, beginning with the

year 1636 and extending up to the year 1793, are given in different Paris doctors' theses and publications, iconographies with biographical notes concerning the deans, and descriptions of their jetons.[12]

When in the middle and second half of the nineteenth century the collecting of photographic portraits became extremely popular, this new hobby not only involved the members of a family, but it was usual for students to collect as a cherished memory photographs of their teachers and fellow students, if possible with signatures. The same was done by physicians who travelled, for example, from America to Europe to get acquainted with centers of modern medical learning and research. Many of them brought home as a souvenir an album with photographs of the great medical men of their time. Such collections, if preserved, are important authentic witnesses, sometimes containing very unusual physical aspects of an outstanding medical leader. They soon replaced the old custom of collecting in an album memorable sentences and signatures of teachers, and also romantic pictures and verses entered by friends, which was so extremely popular among university students in Europe of the seventeenth century and among young persons, especially of the fair sex, during the eighteenth and early nineteenth centuries. Today these individual picture collections are rare. A few are preserved in the Rare Book Department of the Library of the New York Academy of Medicine; a smaller one is in this writer's collection.[13] The publishing industry took advantage of this hobby, and in the middle and second half of the nineteenth century in many different countries books were published and widely sold, presenting the pictures of those physicians regarded by the editor or publisher as the most outstanding representatives of contemporary medicine. This kind of publication in one form or another still appears, and since modern publishers as a rule are not sacrificing idealists, there must still be a market for such iconographies. To study these most recent 'children' of an old type of iconographic literature is rewarding and amusing and reveals much about the psychology of certain times and personalities.

[12] See Fournie (1907), Desavis (1933), and Florange (1933). Probably the first attempt to publish a series of these Jetons Decanaux was made in 1857 and 1858 in a series of articles in the 25th and 26th volumes of the Paris *Magazin pittoresque*.

[13] A similar collection of photographs of famous zoologists, formerly in the possession of J. Victor Carus, has been acquired and described by Harley J. Van Cleave (*Bios*, 1942, *13*, 152-3).

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This list cannot claim to be a complete bibliography but is only a first trial. Included are all the specific iconographies from the field of medical portraits known to the writer, and only such general iconographies as contain a greater part of medical items, or especially interesting ones. The arrangement is chronological. Yearbooks of medical schools with pictures of faculty and students, common in universities in the United States, have not been included.

URSINUS, Fulvius. *Imagines et elogia virorum illustrium et eruditorum.* Rome, 1570. Fol.

GALLEUS, Philipp. *Effigies XLIIII virorum doctorum de disciplinis benemerentium.* Antwerp, 1572. 4°.

Contains 12 portraits of physicians. Also from Antwerp in 1572: *Effigies C L illustrium Belgarum.* Fifteen years later there appeared: *Effigies LI doctorum virorum qui bene de studiis litterarum meruerunt, cum singulorum elogiis, opera.* Antwerp, 1587. 4°.

SAMBUCUS, Joh. [Zsambocki]. *Icones veterum aliquot, ac recentium medicorum philosophorumque elogiolis suis editae.* Antwerp, C. Plantin, 1574. Fol.

A new folio edition followed in 1603: *Veterum aliquot ac recentium medicorum philosophorumque icones, ex bibliotheca Johannis Sambuci cum ejusdem ad singulas elogiis. Premisso hac editione, vitae singulorum & scriptorum indiculo; additis sub finem, diversorum de eisdem encomiis.*

The first edition contained 64 portraits; the second used the same plates. A new edition is supposed to have been printed in 1612 (Moehsen).

Moehsen found the same plates used by a publisher for a book but omitting the text in: *LXI verscheyden schoone Comportimente seer mit en dienstigh voor Beeldtsnyders, Schilders, Antyk-snyders, Schrynwerkers ende alle Konstbeminders.* Amsterdam, 1613.

Another folio edition, with preface by Max Rooses, appeared in Antwerp in 1901: *Icones veterum aliquot ac recentium medicorum, philosophorumque, elegialis suis edita.* Reproduit en fac-simile d'après l'édition de Plantin de 1574.

FENDT, Tobias. *Monumenta sepulcrorum cum epigraphis, ingenio et doctrina excellentium virorum aliorumque tam prisci quam nostri seculi, memorabilium hominum, de archetypis expressa, ex liberalitate nob. & clariss. viri, D. Sigfridi Rybisch & Caesarei Consiliarii, pictorem & civem Vratislaviensem in aes incisa & edita.* Frankfurt, 1574. Fol.

Contains 125 pictures. The same plates were published again at Frankfurt in 1575 with the title, *Monumenta illustrium virorum per Italiam & Galliam.* A third edition was published in 1589 under the title, *Monumenta clarorum doctrina praecipue toto orbi terrarum virorum collecta, passim & in aes incisa sumptu et studio Siegfr. Rybisch.* 3d ed. Frankfurt, a. M., 1589. Fol.

The same 125 pictures made by Fendt were later published with some added eulogies and an index under the title, *Marci Zuerii Boxhornii Monumenta illustrium virorum & elogia.* Amsterdam, 1638. Fol.

CELLIUS, A. M. Erhardus. *Imagines professorum Tubingensium Senatorii praecipue ordinis, qui hoc altero Academiae seculo anno 1577 inchoato in ea*

& hodie anno 1596 vivunt ac florent, ac interea mortui sunt. Tübingen, 1596. 4°.

Contains 73 portraits.

BOISSARD, Joh. Jac. *Icones quinquaginta virorum illustrium, doctrina & eruditione praestantium ad vivum effictae; cum eorum vitis descriptis . . . & in aes incisae per Theodorum de Bry. Frankfurt.* J. Ammon, 1597-8. 4°. 2 pts.

After de Bry's death his sons, Johann Theodor and Johann Israel de Bry, published a 3d part in 1598 and a 4th in 1599. A new edition of the pictures of the first four volumes without text was published in 1628 at Frankfurt as *Vitae & effigies CC virorum illustrium,* and the first part only as *Bibliotheca s. Thesaurus virtutis & gloriae, complectens illustrium doctrina virorum effigies & vitas. Accesserunt clarissimorum aliquot virorum effigies & vitae nunc recens conscriptae.* A fifth volume was published without biographies (20 pictures) by Wilhelm Fitzer in 1635 in Frankfurt. The pictures of all five volumes without biographies were published in 1636 and 1650 under the title, *Bibliotheca chalcographica illustrium, virtute atque eruditione in tota Europa clarissimorum virorum Theologorum etc. collectore Jano Jacobo Boissardo, sculptore Jan. Theod. de Bry ante hac cum vitis editorum, & in quinque partes distributorum, nunc vero conjunctim solis iconibus & distichis singulorum subjiciendis exhibitorum, impensis Joh. Ammonii.* Francof. 1636 & 1650 in 4to. In this edition the scholars are arranged according to the faculties of universities. A supplement to this edition was published as *VI. Pars Bibliothecae chalcographicae id est: Continuatio prima Iconum virorum virtute atque eruditione illustrium, . . . sculptore Sebastiano Firkio, Chal., cui nunc additur natalium & obituum succincta notatio, adjectis singulorum iconibus singulis distichis.* Frankfurt, 1650. 4to. This volume contains 53 portraits. In the same year was published *VII. Pars Bibliothecae chalcographicae,* which contained 50 more portraits made by Clemens Ammon. The 8th volume was published in 1652 by Johann Ammon, and the 9th in 1654 in Heidelberg, each of them containing 50 portraits. So great was the interest in this kind of publication that in 1654 the pictures of all the nine volumes were published again under the title, *Icones virorum illustrium IX Partes;* and finally in 1669, once more in Heidelberg as, *Bibliotheca chalcographica, hoc est: Virtute & eruditione clarorum virorum imagines, collectore Jano Jacobo Boissard, sculptore Theodoro de Bry primum editae & ab ipsorum obitu hactenus continuatae.* This edition has an index but no biographies.

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58 pictures, including physicians.

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Contains 73 portraits, among them 12 physicians.

SAMBUCUS, J. *Veterum aliquot ac recentium medicorum, philosophorumque icones.* Visuriae, 1603; and the same: Amsterdam, 1612.

[MEURSIUS.] *Illustris Academia Lügd. Batava: id est virorum clarissimorum icones elogia ac vitae, qui eam scriptis suis illustrarunt.* Leyden, 1613.

Published anonymously. Thirty-three pictures, among them 8 physicians. Reprinted the following year from Leyden under the title, *Illustrium Hollandiae & Westfriesiae ordinum alma Academia Leidensis. . . .* This edition contains the pictures of four more physicians. There followed another edition in 4° in 1617; a French edition without year was published in 4° under the title, *Les vrais pourtraits des professeurs de Leide.* An enlarged new edition of the book of 1613 in 4° was published in 1625 from Leyden as *Meursii Athenae Batavae sive de urbe Leidensi & academia, virisque claris; qui utramque ingenio suo atque scriptis illustrarunt, libri duo.* This book had a new edition in 1633. Twenty-eight of the pictures were reproduced in 1650 by an etcher, Sebastian Furck in Frankfurt a.M, and published in the 6th vol. of the *Bibliotheca chalcographica.* Forty-eight of the pictures were published in 1705 without year and omitting the biographies. In 1723 a folio edition in two volumes was published in Leyden by Pierre van der Aa.

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Contains 97 pictures.

NICOLAI, Johann. *Effigies & vitae professorum Academiae Groningae & Omlandiae; cum historiola fundationis ejusdem Acad.* Groningen, 1654.

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Notes and Events

Edited by Dorothy M. Schullian, Ph.D.*

Edward R. Cutler and the First "Clean" Appendectomy

When Reginald H. Fitz read his famous paper on *Perforating Inflammation of the Vermiform Appendix with Special Reference to its Early Diagnosis and Treatment* before the Association of American Physicians assembled at Atlantic City on 18 June 1886 he did so as a pathologist, the Shattuck Professor of Pathological Anatomy in the Harvard Medical School. Although he urged "immediate exposure of the perforated appendix" by laparotomy, he was not speaking as a surgeon but as a medical man with general interests and a sound pathological background. Not infrequently in modern times Fitz is referred to as "the surgeon who invented appendicitis," but he was not a surgeon, although he probably should be credited with the name "appendicitis." Indeed, he did not become a recognized hospital internist until the year after he delivered his paper when he was appointed a visiting physician to the Massachusetts General Hospital, and it was not until 1892 that he attained professorial rank in medicine on becoming the Hersey Professor of the Theory and Practice of Physic at Harvard University.

If Fitz did not operate, who did? It was not uncommon for his colleagues at the Massachusetts General Hospital to drain cases of perityphlitis, as the condition was known in 1886, usually after the fifth day of symptoms and most frequently during the second or third week. Surgeons were cautious of this terrifying abdominal inflammation, for about 35 per cent of the patients, according to Fitz, died in the first five days, and surgeons preferred to wait until this period was over, giving those patients who had not succumbed to peritonitis a chance to wall off an abscess in the right lower quadrant of the abdomen. The condition was well known, easily recognized, and the standard procedure was to delay operation as long as possible. During the year 1886, however, most doctors agreed, but some were already acting on their conviction, that earlier operations should be performed. Among them were three surgeons in Waltham, Massachusetts, a city ten miles from Boston. Fitz, also, made it clear that early operation with removal of the inflamed appendix should be the invariable procedure before peritonitis and abscess formation had taken place.

The credit for the first "clean" appendectomy belongs to Edward R. Cutler of Waltham, Massachusetts, who operated on a patient 21 December 1887, 48 hours after the first symptoms of appendicitis, and removed the inflamed organ, allowing the patient to make a rapid and full recovery. The

* Cleveland, Ohio.

diagnosis was not only made before the operation but the procedure was carried out so promptly after the onset of symptoms that the inflammation had not had time to spread to the adjacent structures. The case came about in a most unusual way.

Dr. Alfred Worcester, aged 32, Dr. Cutler's junior partner in Waltham, became ill with appendicitis himself in October, 1887. He was under the care of Drs. Cutler and Henry Wood. Dr. John W. Elliot, aged 35, a surgeon on the staff of the Massachusetts General Hospital, and Dr. Maurice Richardson were called in consultation. Much to Dr. Worcester's surprise Elliot brought with him Dr. Reginald H. Fitz, whom Dr. Worcester did not recognize as a medical consultant, having seen him only in the pathological laboratory at the autopsy table. Apparently it was felt by the three consultants that Dr. Worcester was too sick to justify operation. When Elliot the next day, meeting Dr. Richardson in the Massachusetts General Hospital, told him he was again going out to see Dr. Worcester at his home in Waltham, Richardson thought it was a useless journey, for he felt that by the time Elliot arrived Worcester would certainly be dead. Nevertheless, Elliot had promised Mrs. Worcester to go out again and he did so. Finding his patient somewhat better, he decided to operate. With the assistance of Drs. Cutler and Wood he opened the abdomen and drained an abscess. Convalescence was slow, but ultimately Worcester recovered entirely and lived nearly sixty-five years longer, a well and active man until his death in 1951.

In December of 1887, while Worcester was convalescent from his operation, the railroad station master became suddenly ill. Worcester could not attend him but sent Dr. Cutler, who diagnosed appendicitis and advocated immediate operation. The man refused (saying that if he was as sick as that he would wait till Dr. Worcester recovered!), and all Cutler could do was to go back and report to the convalescent Dr. Worcester. But Worcester was incensed and sent an urgent message to the patient insisting that Dr. Cutler be allowed to operate at once. The patient gave in and was taken to a little hospital in a private house behind Dr. Cutler's residence, where the laparotomy was done 21 December 1887. The inflamed appendix was removed and the patient made an excellent recovery. Cutler, who was 47 at the time, reported this case and ten others, including that of Dr. Worcester, in a paper in the *Boston Medical and Surgical Journal* for 1889.[1]

The unusual circumstances were, of course, the illness of Dr. Worcester, the fact that Dr. Elliot brought Drs. Richardson and Fitz out from Boston to Waltham to see him, the timely decision on Elliot's part to go again the next day and to operate on Worcester, the insistence upon early operation by Worcester as a result of his own experience. The most fortunate aspect of the whole matter was the fact that a patient accepted Worcester's advice and allowed Dr. Cutler to operate early in the course of his illness.

[1] Cutler, Edward R. Eleven cases of operation for appendicitis. *Boston med. surg. J.* 1889, *120*, 554-6.

Credit to Cutler for his operation has been referred to in the medical literature on a number of occasions, particularly by Dwight O'Hara,[2,3] but the historical fact has not found its way into textbooks on the history of medicine, and many physicians are not cognizant of Cutler's experience.

The obituary notice of Alfred Worcester, written in 1951, although unsigned, was from the pen of Dwight O'Hara. It contains a correct reference to Cutler, but the best account is in O'Hara's paper of 1954, where he prints the actual case report in Worcester's own words[4] as well as an excellent picture of Cutler taken from a photograph.

HENRY R. VIETS

Robert Boyle — Poet

We draw attention to a poem by Robert Boyle so far omitted, perhaps charitably, by his bibliographer John F. Fulton.

Entitled "The Deist's Plea, answered by the Honourable, *Robert Boyle,* Esq;." it appeared, five months after Boyle's death, on pp. 27-8 of a small octavo volume of poems edited by Charles Gildon (1665-1724) entitled *Miscellany Poems Upon Several Occasions,* London, 1692 (Wing G 733A). Gildon apparently considered himself Boyle's friend (although he is not mentioned by Boyle's biographers), for in the Epistle Dedicatory he wrote that this was "*no* Vulgar Book, *of my own Composing, but . . . one that ows its excellence to the generous contributions of my Friends of undoubted* Wit." By profession a miscellaneous writer and "hack author" (*Dictionary of National Biography*), Gildon was described as "a person of great literature, but a mean genius; who, having attempted several kinds of writing, never gained much reputation in any" (John Nichols, *Literary Anecdotes of the Eighteenth Century,* London, 1812. Vol. 1, pp. 24-5).

How Gildon came by this poem or what right he had to print it does not appear, but there can be little doubt that it was written by Boyle. Had Gildon merely invented it in order to add lustre to his anthology he would have displayed Boyle's name on the title-page. That he did not do so (see Fig. 1) shows that he thought him of lesser importance than his other authors, and so removes the only motive he might have had for using Boyle's name in vain.

Further, the argument of the poem expresses sentiments dear to Boyle's heart which he had expounded many times at length and in similar terms, for example in *The Excellency of Theology, Compar'd with Natural Philosophy* (1674, Fulton 116) in which deists are specifically answered and in which he reaffirmed his belief in the divine revelation of scripture as a

2 Obituary. Alfred Worcester, 1855-1951. *New Engl. J. Med.,* 1951, *245,* 510-11 (port.).

3 O'Hara, Dwight. An early appendectomy. *New Engl. J. Med.,* 1954, *250,* 289-90. (port.)

4 The complimentary dinner to Dr. Alfred Worcester. (Hotel Somerset, Boston, 1 December 1924). *Boston med. surg. J.,* 1925, *192,* 561-8.

MISCELLANY

POEMS

UPON

Several Occaſions:

Conſiſting of

Original Poems,

BY

The late Duke of *Buckingham*, Mr *Cowly*, Mr. *Milton*, Mr. *Prior*, Mrs. *Behn*, Mr. *Tho. Brown*, &c.

And the Tranſlations from *Horace*, *Perſius*, *Petronius Arbiter*, &c.

WITH

An Eſſay upon Satyr,

By the Famous *M. DACIER.*

Licens'd *May* 21. 1692.

LONDON,

Printed for Peter Buck, at the Sign of the *Temple*, near *Temple-Bar*, in *Fleetſtreet*. 1692.

Figure 1.

source of knowledge. Even earlier he had elaborated his viewpoint in *Some Considerations touching the Style of the H. Scriptures* (1661, Fulton 41): *"And that the Study of the Works of Nature has not made me either Disbelieve the Author of them, or Deny his Providence, or so much as Disesteem his Word, which Deserves our Respect upon several Accounts, and especially that of its being the Grand Instrument of Conveying to us the*

Fauera, nec cum ſe ſub leges pacis iniquæ
Tradiderit, regno aut optata luce fruatur,
Sed cadat ante diem, mediaq; inhumatus arena.

The Deiſt's Plea, anſwered by the Honourable, *Robert Boyle*, Eſq;

The Deiſt's Plea.

NAtural Religion, eaſie firſt and Plain;
Tales made it Myſtery, Offerings made (it gain;
Sacrifices and Feaſts were at length prepar'd,
The Prieſts eat roaſt Meat, and the People ſtar'd.

The Chriſtian's Plea.

NAtural Religion does indeed diſplay
The Duty of ſerving God, but not the (way:
Man of himſelf roving, perverſe and blind,
A Precipice ſooner than that way would find,
What

Figure 2.

What Worſhip God will like: Himſelf muſt (teach,
And ſo he did, by thoſe he ſent to preach;
Who Doctrins worthy to be thought Divine,
Confirm'd by Miracles, where his Power did (ſhine:
Who by thoſe Wonders, Inſtances did give
Of things, as ſtrange as they bid us believe;
Who promis'd endleſs Joys, and Lives requir'd
Worthy of thoſe, that to ſuch Joys aſpir'd,
Who what they taught ſo much believ'd (and pris'd
That, for its ſake, they all things elſe deſpis'd:
And both by its ſtrict Rules their Lives did (guide,
And to atteſt its Truth moſt gladly dy'd;
And without Arms ſubdu'd the World, ſave (thoſe
Whom Vice, not Wit, engag'd clear Truths (t'oppoſe.

Julii

Figure 3.

Truths and Mysteries of the Christian Religion. My Embracing of which I know not why I should be Asham'd to own, since I think I can to a Competent & Unprepossess'd Judge give a Rational Account of my so doing."

At the end of his life Boyle returned to this topic in *The Christian Virtuoso* (1690, Fulton 191), in *An Appendix to the First Part of the Christian Virtuoso,* and in *The Christian Virtuoso the Second Part,* both published posthumously in Birch's 1744 edition of Boyle's *Works* (Fulton 240). The poem possibly dates from this time; it is reproduced in Figures 2 and 3.

IDA MACALPINE
RICHARD A. HUNTER

The Portrait of Vesalius from the Fabrica

It has been noted by previous authorities commenting on the woodcut portrait of Vesalius dissecting the muscles of the arm that "in height the corpse exceeds that of the demonstrator. . . . Others . . . have already remarked on the very evident lack of proportion between the dimensions of the body of Vesalius and those of the dissected arm in his grasp."[1] It has likewise been noted that the head of Vesalius is too big and out of proportion with his body. Charles Singer, for example, states[2] that "some good artist—Calcar or another—drew . . . a *head* of Vesalius. . . . The craftsman [the woodcutter] . . . finished [the portrait] by putting it in a composition of his own, which is obviously not the work of a trained artist."

In a stimulating paper delivered at the International Congress of the History of Medicine in Madrid in September, 1956, Charles Donald O'Malley drew attention to the remarkable point that Vesalius in the second edition of the *Fabrica* mentions having dissected the body of a giant woman. This would provide a probable explanation of the puzzle. The profession eagerly looks forward to the publication of this remarkable paper.

There seems to be, however, another possible explanation based on the manner in which the artist conceived the portrait. He may well have been inspired by the greatness of anatomy as revived by the genius of Vesalius. On this theory he would have magnified the corpse disproportionately and depicted it not supine, as in the real dissection on the title-page, but erect, like a Greek statue flanked by an Ionic column. The anatomist is in process of demonstration; his hands grasp the arm of the corpse in a forward movement, toward the spectator. One has the feeling that here the grandeur of anatomy is symbolized almost in rallying fashion and that the spiritual world of the artist and of Vesalius himself is reflected. Were it permitted, one would be tempted to see the elements of a crusading poster in the portrait which became a revered testimonial to the Rise of Anatomy.

Some tendencies which may have influenced the aesthetic details have been repeatedly stressed when the portrait was described. The inkpot and the legend "De musculis digitos moventibus . . ." on the dissection table can be understood as a graphic symbol of immediate observation versus mere book learning. The legend engraved on the scroll was intended to dispute Galen's doctrine on this point.[3] Even the rich suit of the demonstrator may have been inspired by the intention to give greater solemnity to anatomy. The disproportionately larger head of Vesalius is, according to Spielmann, perhaps also of symbolic significance. This disproportion, as O'Malley observed in a personal remark to the writer, is not easy to explain. It may be understood, if we follow Spielmann, on the basis of the

[1] M. H. Spielmann, *The iconography of Andreas Vesalius*, London, 1925, pp. 2, 4.

[2] *J. Anat.*, 1943, 77, 264; see also J.B.deC.M. Saunders and Charles D. O'Malley, *The illustrations from the works of Andreas Vesalius*, Cleveland and New York, 1950, p. 41.

[3] Cf. Moritz Roth, *Andreas Vesalius Bruxellensis*, Berlin, 1892; Spielmann; Saunders and O'Malley.

artist's reverence for mental capacities. In the famous portrait of Paracelsus, signed A. H. and usually ascribed to Augustin Hirschvogel, the head is again slightly overproportioned, in the engraving of 1538 in comparison with the arms, in that of 1540 with the very small hands. The more modern Swiss painter Ferdinand Hodler drew disproportionately big hands when he painted a lumberman cutting wood. Even Renaissance artists like the Flemish painter Bosch excelled sometimes in presenting details which were not realistic.

In speaking of the artist's "intentional" approach we are reminded of the use of the word intentional in scholastic philosophy. This use, which was still alive in the sixteenth century, can be defined as follows: "Of or pertaining to intention, or conception or apprehension; as, intentional being [L., *ens intentionale*], being which exists in the mind alone, as conceptions or notions;—contrasted with *ens reale*."[4]

Such an explanation of certain details in the portrait of Vesalius may be corroborated by analyzing aesthetically some parts of Old Testament poetry. When in the *Song of Songs* 7:4 the lover exclaims, "Thy nose is as the tower of Lebanon," the poet is not describing the real configuration of the nose but is trying to present the concept of loftiness and perfection.

At the same congress the excellent German historian Walter Artelt commented on the title-page to the *Fabrica*. He felt rightly that "the striking and turbulent scene"[5] is so overcrowded that one would be tempted to refer the illustration from the Renaissance to the baroque period. Here again it seems that the effort of the artist to portray grandeur interfered with the style of the period in much the same way that the attempt in the portrait of Vesalius to stress the greatness of anatomy resulted in a certain amount of disproportion.

JOSHUA O. LEIBOWITZ

The "First" U.S. Military Hospital

During the siege of Boston in June 1775, the Continental Congress meeting in Philadelphia renamed the militia (Minute Men), raised under the auspices of the First Provincial Congress, the Continental Army, with Washington in command. Troops were moved in from neighboring New England states and from Pennsylvania, Maryland, and Virginia. By 17 June there were approximately 10,000 under arms at the Battle of Bunker Hill. When Washington reached Cambridge in July, some 14,500 men formed his first Continental Army.

Before 1775 there appear to have been no military hospitals designed for the sick and wounded, but some sort of care was probably given in private homes in Cambridge, Roxbury, and elsewhere on the periphery of Boston. The Third Provincial Congress, meeting in Cambridge on 22 June,

4 *Webster's new international dictionary of the English language*, 2d ed., unabridged, Springfield, Massachusetts, 1954.

5 I use the words of Saunders and O'Malley, p. 42.

ordered "that a hospital be provided for the camp at Roxbury, and that Col. Davis, Doct. Taylor and Doct. Whiting, be a committee to provide one accordingly, and to supply the same." The committee acted promptly, for the next day (23 June) the record reads that "The Committee appointed to provide a hospital for the camp in Roxbury, reported as follows: That they have appointed the house belonging to Joshua Loring, in said Roxbury, for a hospital, and for the use of said camp." On 24 June two surgeons and two mates were authorized, their pay being 8 pounds per month for the surgeons and 4 pounds, 10 shillings for the mates. On 27 June another hospital was authorized, this one to be for patients with smallpox, and Drs. Rand and Foster were added to the original committee under Colonel Davis.

Thus the Provincial Congress, acting with great speed, made use under the patriot banner of some of the best medical men of the day. The four doctors mentioned as serving on the committee undoubtedly had all been close friends of Joseph Warren who had died a few days earlier at Bunker Hill. Led by the inspired Warren, twenty-two physicians were serving in the Provincial Congress.

The house chosen as the hospital for the camp at Roxbury was the Loring-Greenough house, built about fifteen years before 1775 by Commodore Joseph Loring, a British naval officer, and still standing on South Street, Jamaica Plain, as that part of Roxbury is now known. This square, two-and-a-half story, wooden house, typically Colonial in style, was used at the time as the headquarters of General Nathanael Greene, who commanded the detachment of militia in Roxbury and later was to take charge of all the soldiers in Boston after the evacuation. How much the house was used during the winter of 1775-6 as a "hospital" is uncertain. The period of its service for this purpose, however, can not have been long, for after the British army left Boston in March 1776, the Almshouse on Park Street, facing the Common, established early in the eighteenth century and used by the British as a military hospital during the siege, again became available, and the inoculation hospitals on Point Shirley and Castle William in Boston Harbor, set up as early as 1764, could be used for smallpox, the most prevalent disease among the soldiers.

HENRY R. VIETS

Harvey Tercentenary Congress

At the Harvey Tercentenary Congress held in London 3-7 June 1957, the first session was devoted to the knowledge of the circulation from the seventeenth to the twentieth century. Speakers from this country were John F. Fulton on "Completing Harvey's Work: Discovery of the Capillaries—Malpighi, Leeuwenhoek, and Hales" and F. A. Willius on "Historical Sequences relating to Certain Congenital Anomalies of the Heart and the Great Vessels." Succeeding sessions emphasized the role of the heart in the circulation, haemodynamics, the coronary circulation, the pulmonary circu-

lation, the results of cardiac surgery, the cerebral circulation, the splanchnic circulation, and the peripheral circulation; the speakers included L. W. Katz of Chicago, Donald E. Gregg of Washington, Claude S. Beck of Cleveland, André Cournand of New York, Seymour S. Kety of Bethesda, and Stanley E. Bradley of New York. Ceremonies at Folkestone 8-9 June included a paper on Harvey's birthplace and a civic procession to his statue.

There were memorial services at St. Paul's Cathedral, Canterbury Cathedral, and Folkestone Parish Church, and receptions by the University of London at the Senate House, by Her Majesty's Government at Lancaster House, by the Royal College of Physicians of London at the College, and by the President and Council of the Harveian Society at Gray's Inn.

Honors to Carl von Linné

The Swedish naturalist Carl von Linné, or Carolus Linnaeus, who, be it remmebered, took a medical degree at the University of Harderwijk in the Netherlands, was born on 13 May 1707. This year during the entire month of May the 250th anniversary of his birth was fittingly celebrated in Sweden, the Netherlands, and elsewhere. The city of Uppsala staged a Linné Week to accompany the awarding of honorary degrees by its university on 31 May; for this event more than twenty foreign scientists assembled, and there were lectures and discussions on current questions of systematic botany and on Linné's research and experiments. In the southern province where Linné was born a special jubilee was held in the city of Växjö, and the modest parsonage in Stenbrohult parish where he first saw the light of day was restored for the occasion. Queen Juliana and Prince Bernhard of the Netherlands made an official visit to Sweden 21-23 May in connection with the celebrations.

Dr. George Rosen Assumes New Responsibility

As of August 1957 Dr. George Rosen will take over the editorship of the *American Journal of Public Health.* His many friends among the readers of the Journal will wish him well in this important and influential position and at the same time commend his courage in adding this responsibility to the many others he is already carrying.

Oxford Confers Degree on Dr. Fulton

On 26 June 1957 at an Encaenia Oxford University conferred the degree of Doctor of Literature on Dr. John F. Fulton.

Deutsche Vereinigung für Geschichte der Medizin

The Ninth Annual Meeting of the Deutsche Vereinigung für Geschichte der Medizin will be held in Regensburg 28 September-2 October 1957. The Eighth Annual Meeting, which took place in Aachen 3-7 October 1956, is

fully reported, with minutes of the proceedings and abstracts of the papers, in the *Nachrichtenblatt* of the society, No. 8, February 1957. This issue carries on pages 20-4 an obituary of George Sarton by Willy Hartner.

Ohio Academy of Medical History

The Annual Meeting of the Ohio Academy of Medical History was held in Cleveland 26-27 April 1957. Seven papers were presented at the regular sessions at the Allen Memorial Medical Library, and at the banquet at the Wade Park Manor Dr. Harold Feil illustrated with slides "The Story of the Foxglove." Dr. Leon Goldman of Cincinnati was elected to succeed Dr. Henry H. Fertig of Cleveland as President; the meeting in 1958 will be held in Cincinnati. Dr. Chauncey D. Leake is Vice-President and President-Elect.

Tribute to Dr. Jean A. Curran

In 1937 Dr. Jean A. Curran was called to the institution in Brooklyn which was then known as the Long Island College of Medicine. His earlier career and his services there to 31 December 1956 are lovingly traced by Dr. Phillip E. Lear in the *Alumni Bulletin of the State University College of Medicine at New York City*, 1957, *13*, 7-15.

Dr. Curran found an aged and rather decrepit plant on Henry Street. He began to dream and to act. His interests lay in training better physicians and in giving better care to patients. The ancillary services of medicine were of great concern to him, and the missionary spirit evinced by his work in the Orient guided him also in New York City. Gradually, and always with the devoted encouragement of his wife Frances, he raised the annual budget from $300,000 to $3,300,000, the faculty from 325 to 900. In April, 1950, a merger was consummated with the State University of New York, and the college became that university's Downstate Medical Center. In 1956 the scene shifted to Clarkson Avenue and a multi-million dollar edifice.

Dr. and Mrs. Curran have now moved to Boston, where Dr. Curran has assumed the post of full-time consultant to the Trust for Charity established by the late William Bingham, 2d, of Bethel, Maine. He will continue as consultant to the University and Professor of the History of Medicine at its Downstate Medical Center. Through the busy years he has found time to serve also as consultant to the War Manpower Commission, the Surgeon General of the Army, and the World Health Organization. He is a member of the Board of Regents of the National Library of Medicine.

Historical Gleanings

In a paper presented at the Fifty-Eighth General Meeting of the Archaeological Institute of America and abstracted in the *American Journal of Archaeology*, 1957, *61*, 181, J. Lawrence Angel of the Daniel Baugh Institute of Anatomy, Jefferson Medical College of Philadelphia, reported on

the skulls and skeletons of twenty-seven people from the "Royal" shaft graves of Mycenae, largely from the excavations of 1951-54. These showed a distinct champions' physique in comparison with the general population of Middle Helladic Lerna and Asine. There was an excess of Nordic-Iranian and a lack of delicate Mediterranean tendencies. Bone injuries, and a life span of about thirty-six years, which was normal for the Bronze Age, reveal that these individuals were not pampered princes but led in physical conflict as well as socially.

In an article on sunken imagery in the *Oedipus Tyrannus* of Sophocles (*American Journal of Philology*, 1957, *78*, 36-51) Herbert Musirillo, S. J., revives the problem of the identification of the great Athenian plague which is recounted by Thucydides (II.47 ff.). He cites two fairly recent discussions of it which may not have come to the general attention of medical historians. In one (*Classical Quarterly*, 1953, *47*, 96-119) D. L. Page argues that the plague was a peculiarly virulent form of measles; this view has not yet won general acceptance. In the other (*C.Q.*, 1954, *48*, 171-4) Sir William P. MacArthur defends the older view that it was a typhus epidemic. The difficulty of diagnosing today this and other historical epidemics is discussed by G. Rath in *German Medical Monthly*, 1956, *1*, 282-5.

By a beautiful, solid, and merry demonstration, and with the co-operation of Tiffany's of New York, Heinz's Cider Vinegar, and the Chemistry Department of the University of North Carolina, Berthold L. Ullman shows in *The Classical Journal*, 1957, *52*, 193-201 that Cleopatra (Pliny 9. 119-21) knew what she was doing medically when she dissolved her pearl earring in vinegar and swallowed it. To the ordinary ancient who had banqueted in too sumptuous a manner the alkalizing agent was lime; its use as an antacid is attested for example in Pliny 36. 180. Cleopatra, instead of adopting plain lime powder in her bet with Antony which was refereed by Lucius Plancus, consumed her equivalent of bicarbonate of soda (and also her 10,000,000 sesterces) in more exotic fashion. Powdered pearls are speedily dissolved in vinegar, and later authorities like Albertus Magnus, Alfonso X of Castile, and Francis Bacon reveal a continued interest in their medicinal value.

It is pleasant to report progress on a translation of Galen's *De usu partium* which was announced in the Journal, 1950, *5*, 232. Mrs. Margaret Tallmadge May of Ithaca, New York, has continued with her translation of this important work and has now carried it through Book XI. In an age when facility in foreign and especially in ancient languages is no longer common, the value of accurate translations of landmarks in the history of medicine cannot be too greatly stressed. Historians will be grateful for every new translation which will make more readily available to them the contributions of the past.

The newly discovered catacomb fresco of the Via Dino Compagni in Rome (this Journal, 1956, *11*, 354; 1957, *12*, 88), which immediately aroused such heated discussion among medical historians, art historians, religious historians, and archaeologists, has now been included in a book on ancient surgery. Mario Tabanelli in his *Chirurgia nell'antica Roma* (Torino, Edizioni Minerva Medica, 1956) discusses it on pages 116-8 and presents in Plate 79 a clear photograph of it. He interprets it not as a dissection scene but as a clinical lesson on a living patient, and cites in support the following passage from the *De medicina* of Celsus, I. Prooem.43: "Si quid tamen sit, quod adhuc spirante homine conspectu subiciatur, id saepe casum offerre curantibus. Interdum enim gladiatorem in harena, vel militem in acie, vel viatorem a latronibus exceptum sic vulnerari, ut eius interior aliqua pars aperiatur, et in alio alia: ita sedem, positum, ordinem, figuram, similiaque alia cognoscere prudentem medicum, non caedem, sed sanitatem molientem; idque per misericordiam discere, quod alii dira crudelitate cognorint." The fresco is also mentioned by A. W. Van Buren in *American Journal of Archaeology*, 1956, *60*, 389-90.

A new journal, *Manuscripta*, to be published three times annually by Saint Louis University Library under the editorship of Lowrie J. Daly, issued its first number in February, 1957. One of the stated purposes is the publication of articles based upon research in the manuscript collections of The Knights of Columbus Vatican Film Library, which is located at Saint Louis University. Since this film includes many Vatican manuscripts in the fields of early science and medicine, historians who can journey more easily to St. Louis than to the Vatican City will wish to avail themselves of it. It is anticipated that when the present phase of the microfilming project is completed, the Film Library will contain some thirty thousand Greek and Latin manuscripts. A check list of their numbers will be given in *Manuscripta;* the first installment, covering approximately the first five thousand of the *codices Vaticani latini*, appeared in the February issue. Also available at the Film Library is a photographic copy in card form of the dictionary card catalogue of Vatican manuscripts, which is still far from complete but comprises at present some three hundred thousand cards. For scholars not familiar with the Vatican Library, *Manuscripta's* analysis (by Charles J. Ermatinger) of this catalogue, of the official printed catalogues, and of the still indispensable handwritten inventories and indices, which can now be consulted on film, will be very helpful.

In this connection it may be stated that Augusto Beccaria's long-awaited and definitive catalogue of early medical manuscripts at the Vatican Library and elsewhere was published at the close of 1956. It is entitled *I codici di medicina del periodo presalernitano* and can be obtained from Edizioni di Storia e Letteratura, Via Lancellotti 18, Roma. A review of it will appear in a later issue of this Journal.

At the annual meeting of the Mediaeval Academy of America in Cambridge, Massachusetts, on 26 April 1957, Paul Oskar Kristeller presented a paper entitled "New Sources on Salerno Medicine in the Twelfth Century."

In *Speculum,* 1957, *32,* 84-7, Ernest Hatch Wilkins argues convincingly in support of the view that Petrarch's *Ad seipsum* (*Epistolae metricae* I.14), which was written in the midst of a terrible and widespread pestilence, must be assigned to the year 1348, when the Black Death was raging in Italy, France, and elsewhere, and not 1340, when only Tuscany appears to have suffered. Petrarch's experience with the Black Death is cited also by G. Rath in *Ciba-Symposium,* 1956, *3,* 196.

Prof. Gaetano Pieraccini, the Florentine physiologist and pathologist whose work with the skeletons of the Medicis was reported in these pages, 1955, *10,* 431, died on 13 April 1957 at the age of 82. He had served as Senator of the Italian Republic and was Mayor of Florence immediately after World War II.

Gerhard Eis mentions in *Sudhoffs Archiv,* 1956, *40,* 289 a manuscript in Nürnberg, Cod. 3227ª of the Germanische Museum there, which once belonged to Dr. Nicolaus Pol. A fuller notice of this manuscript, with a listing of other Pol items which have been brought to light since the publication in 1947 of Max H. Fisch's *Nicolaus Pol Doctor 1494* and a survey of additional biographical details, is planned for a later issue of the Journal.

In his *Library Catalogues of the English Renaissance* (Berkeley and Los Angeles, University of California Press, 1956) Sears Jayne opens interesting possibilities to historians desirous of reconstructing the libraries of English physicians of this period. It was a period when only three groups of people as a class owned books in any numbers—the clergy, University scholars, and physicians. In their personal notebooks containing favorite prescriptions, hints on diagnosis, and memoranda of unpaid accounts, the physicians frequently jotted down also the names of their books, and these, together with more formal lists, can be used to document studies of medical practice and medical reading in the period. The index of the volume includes some thirty references to medicine and entries also for physics and surgery. In the list of private libraries, catalogues including medical items are noted chronologically for Henry Beaumont (1500), Surgeon John Thomas (1545), Dr. Thomas Wendy who was physician to Edward VI, Queen Mary, and Queen Elizabeth (1560), an unknown physician of Hampshire (1565-1573), Dr. Thomas Lorkin of Cambridge (1591), an unknown physician (1617), Thomas Hopper of Oxford (1623), an unknown physician (*c.* 1627), Dr. Robert Fludd (1630), Robert Welles (1632), Sir William Paddy who was physician to James I (*c.* 1634), and Surgeon John Deighton of Gloucester. The frontispiece reproduces the first page of the catalogue of Sir Kenelm Digby's gift of 233 manuscripts to the Bodleian Library in 1634.

A Rue Vésale is to be expected in Brussels, a Via Andrea Vesalio in Padua. But it was the Via Andrea Vesalio in Rome which made headlines in *Il Messaggero di Roma* of 5 February 1957, when a gas main broke, one person died, and numerous residents of the neighborhood were poisoned by escaping fumes.

A painting famous in the history of anatomy was recalled in *Il Messaggero di Roma* for 9 February 1957, when a reporter writing on the Wilma Montesi case then on trial in Venice compared the four professors of legal medicine who had performed the autopsies on her body to the group gathered around the cadaver in Rembrandt's "Anatomy Lesson." The parallel is not wholly accurate, if only for the reasons that the figures number eight in the painting and that of them only one, Dr. Nicolaas Tulp, is dissecting. The painting, done on commission for the Amsterdam Guild of Surgeons in 1632 when Rembrandt was twenty-six years old, was displayed in new glory at the Mauritshuis Museum in The Hague on 5 September 1951, after an eight-month restoration job had freed it of four successive layers of varnish, retouchings, and overpaintings. An account of the restoration was carried in *The New York Times* of 9 September 1951.

Of special significance in a Harvey year is the note by Henry R. Viets entitled "Young Montgomery and his Beating Heart" in the *New England Journal of Medicine*, 1957, *256*, 702-3. In this Dr. Viets calls attention to the clinical description in Harvey's *Exercitationes de generatione animalium* (1651) of a young man who had lost the anterior part of his chest by accident and so carried an open window to the heart where that organ could be seen and even palpated. Hugh Montgomery, who became Viscount on the death of his father in 1642, was eighteen or nineteen when Harvey took him to Charles I and demonstrated the action of his heart. Dr. Viets points out that he was in addition an admirable example of rehabilitation, for he overcame his severe handicap, fought gallantly for King and country, married twice and had two sons, and died only in 1663, at the age of forty.

La famèia bulgnèisa, Strenna 1957 (Bologna, 1956) carries on pages 117-33 an article by Ladislao Münster on Maestro Francesco Bartolotti da Parma, "medico delle teste." Of interest also is the note by Alessandro Cervellati, pages 54-6, on the statue of Galvani in the piazza behind San Petronio in Bologna. In January, 1932, this statue, erected in 1879, lost the four fingers of its left hand when the trolley of a tram fell upon it. With typical Bolognese humor and logic the accident was at once proclaimed an industrial accident. Who promoted the first beginnings of electricity? Galvani. Who therefore created the dangers of falling trolleys? Galvani, of course. And who suffered? His statue.

A convenient survey of the phenomenal activity in many fields of Albrecht von Haller is given by Dr. A. Schierbeek in *Biologisch Jaarboek*, 1956, *23*, 348-81.

Writing in *Museum Echoes* of the Ohio Historical Society, 1957, *30*, 11-13, S. Winifred Smith asks greater recognition for Benjamin Drake, whose fame has been somewhat eclipsed by that of his illustrious older brother Daniel. Benjamin came to Cincinnati in 1814 to clerk in Daniel's drug store, but he chose finally the profession of law and with his legal practice combined a notable literary career. From 1826 to 1834 he edited the *Cincinnati Chronicle and Literary Gazette.* His first volume, a collection of brief factual sketches and of his own short stories, all of which have a western setting, was published in 1838 under the title *Tales and Sketches from the Queen City;* it is cited by Daniel in *Pioneer Life in Kentucky,* edited by Emmet Field Horine (New York, 1948), p. 194. Benjamin also did biographies of Black Hawk, of William Henry Harrison, and of Tecumseh. The first was so popular that it went through thirteen printings within a few months and appeared in several editions even after the death of its author in 1841. Clearly Daniel was not the only gifted member of the Drake family.

The *Raccolta de' proverbi toscani* of Giuseppe Giusti and Gino Capponi has been issued in numerous editions since its first appearance in 1853. The collection, once more augmented, received its newest dress in December, 1956. The publisher is Veronelli of Milano, the title now *Dizionario dei proverbi italiani.* This edition contains on pages 283-92 a wealth of vigorous proverbs on health, diseases, and physicians.

The Italian version of Vincenzo Gabelli's article on the Anatomical Theater at Bologna (Journal, 1956, *11*, 440-3) appeared at almost the same time in *La Mercanzia,* organ of the Chamber of Commerce of Bologna, 1956, *11*, 760-5.

Readers familiar with Hans Sallander's *Bibliotheca Walleriana* (reviewed by the Editor of this Journal, 1956, *11*, 359-60 and by Walton Brooks McDaniel, 2d in *Bull. Hist. Med.*, 1956, *30*, 382-3) will wish to consult also the penetrating review by F.N.L. Poynter in *The Library,* Fifth Series, 1956, *11*, 294-6.

First Report of the Wellcome Trust

The Wellcome Trust has recently published a *First Report Covering the Period 1937-1956* (London, 1957, 86 pp.) describing the origin, activities, and accomplishments of the Trust during the first twenty years of its existence. It is a most informative document, so gracefully written that, unlike most reports, it is a pleasure to read. After succinctly reviewing Sir Henry Wellcome's life, his interests, and the Will which established the Trust, the Report gives a history of the Trust's activities beginning in 1937 and recounts the successful solutions to problems of inheritance taxes, the executive direction of the extensive business interests (The Wellcome Foundation Limited), and "the abnormal activities and demands imposed by the war."

Thus more than a decade passed before the Trustees could devote their major efforts to "charitable promotion and support."

Nevertheless, the Trustees have made various types of grants in support of activities described at some length and totaling £1,170,164 some of which was unexpended though committed at the end of the twenty-year period. Section II of the *Report* is entitled "Classified List of Grants," and it itemizes the Trust's benefactions under five major headings: "Medical and Veterinary Research"; "Medical Research Museums and Libraries"; "Grants for Research in the History of Medicine"; "Archaeology," in which field the Trustees "will not be able to consider applications for help to further projects" now that those in which Sir Henry Wellcome was personally interested have been completed; and "Wellcome Medals and Prizes."

Readers of this *Journal* will be particularly interested in sections dealing with the history of medicine, "for the Trust is exceptional in having a specific mandate to aid research in that subject." Exclusive of travel grants, benefactions in support of research in the history of medicine have totaled £64,053—generous support indeed when it is realized that all but two of the grants were made in the last ten years.

Except for five appendixes listing the recipients of Wellcome Medals, publications subsidized by the Trust, and publications of laboratories supported by the Trust, Section III on "Policy" is the last of the *Report*. The first paragraph of this Section sets forth the general policy of the Trustees:

> The account of the activities of the Trust which has been given in the preceding pages will have made it clear that, in making grants in accordance with the terms of their Trust, the policy of the trustees has hitherto been one of opportunism. They have, in general, aimed at giving support to enterprises of which the merits were endorsed by the best available scientific opinion, but which for one reason or another, had not so far received the support which they needed. The trustees believe that they can most usefully perform their function by developing their programme essentially on opportunist lines. Thus, while continuing to give some preference to subjects such as tropical medicine, pharmacology, pharmacy, therapeutics, and veterinary medicine, in which Sir Henry Wellcome had himself shown a lively interest, they will endeavour, both in these and in other fields, to identify and fill important gaps in the existing facilities for promoting and assisting research, rather than merely to duplicate the activities of other grant-making bodies.

This well-written, well-organized, and instructive *Report* is a model and stands by itself as a document in the history of medicine.

Wellcome Trustees' Grant to Montreal

The Wellcome Trustees have made a grant of £5,000 to McGill University, Montreal, for the purchase in the sterling area, of books related to the history of medicine which are needed to fill important gaps in the Osler Library. The Trustees have also agreed to provide £1,200 annually for twenty-five years to assist the further development of this Library.

A new extension and reading room for the Library, to be known as "The Wellcome Camera," is to be provided by McGill University.

THE SCHUMAN MEDICAL HISTORICAL ESSAY PRIZE

Mr. and Mrs. Henry Schuman of New York offer annually a prize of $250.00 for an original essay written in English, *not to exceed 10,000 words,* on some subject pertaining to the history or philosophy of medicine.

To be eligible, an essay must be written by a doctor of medicine or of one of the medical sciences who has taken his or her M.B., M.D., or Ph.D. degree not more than five years prior to submission of the paper. The competition is open to candidates of any country. Essays which have won awards in other contests are not eligible. The prize-winning essay will be published in the *Journal of the History of Medicine.* The judges reserve the right to withhold the prize in any year if no essay is deemed of sufficient merit.

Entries should be submitted on or before 1 May 1958 to Dr. John F. Fulton, Yale University School of Medicine, 333 Cedar Street, New Haven 11, Connecticut, U.S.A.

SCHUMAN PRIZE COMMITTEE

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